50 Hints of Cosmic Purpose

Mark Mahin
New York, 2013

The book that follows is a book I wrote in 2013. It has been for sale for years on www.amazon.com, but I am now uploading it to www.archive.org where it will be available as a free download. For more recent information on the topics discussed, view my blogs and books mentioned below.

Mark Mahin
marjinsopmar@gmail.com
www.markmahin.com
www.futureandcosmos.blogspot.com
www.orbpro.blogspot.com
www.headtruth.blogspot.com

Read my other free other books at www.archive.org:
Why Mind and Memory Cannot Be Brain Effects
https://archive.org/details/combinepdf_20200924
800 Mysterious Striped Orbs: A Paranormal Phenomenon
https://archive.org/details/800-mysterious-striped-orbs
Vast Precision of the Orb Patterns
https://archive.org/details/vast-precision-of-the-orb-patterns

Contents

Introduction

Is there a purpose behind the universe?

Materialists very confidently give an answer to this question. They claim that the universe is a purely accidental thing, without any design or purpose. They say that our galaxy, our sun, our planet, and our species are merely the result of lucky accidents. According to this viewpoint, blind, purposeless chance is what rules the universe, and we are merely like dust being blown around by the wind. Such an outlook says there is no deity or God to thank for anything, and that there is no plan behind any of the universe's mysterious workings. Let's call this idea the Blind Chance dogma.

This Blind Chance dogma has been advanced very stridently by a host of proponents. But there is one big problem with this doctrine. There are several dozen good lines of evidence that dramatically refute this doctrine. These lines of evidence are the "50 Hints of Cosmic Purpose" that I will discuss in this book. These lines of evidence suggest that there is a plan behind the universe, that there is some mysterious power or powers pushing the universe towards some purposeful goals.

The proponents of the Blind Chance dogma would have us believe that the evidence is on their side, but it is not. What is striking is how abundant and multifaceted is the evidence for cosmic purpose. It is like a grand chorus of voices singing the same tune. When we examine issues of cosmology (the origin and large-scale structure of the universe) we find many reasons for thinking that there is a plan and design behind the universe. When we examine the opposite end of the physical scale (the subatomic world) we also find many reasons for believing in cosmic purpose. When we examine the laws of nature and the fundamental forces of nature, we find strong additional reasons for suspecting cosmic purpose. When we examine certain parts of the world of human experience, we can also find many reasons for thinking that we are part of some great cosmic plan.

We can find some of the reasons for cosmic purpose in the natural world, and others can be found in the world of paranormal phenomena and psychic phenomena. The proponents of the Blind Chance dogma try to shut the door to any consideration involving the paranormal. Such proponents typically advance a series of dogmas that include the doctrine that we currently understand all the main forces of nature, and the doctrine that all human mental activities are purely the result of brain activity. They use these dogmas to exclude a wide variety of human experience and

observations involving paranormal phenomena.

But these dogmas are not science. They are assumptions that involve their own "leaps of faith." Science can be defined as the sum of all observations and experiments reported in scientific papers. No scientist has ever done a scientific paper showing that consciousness is solely produced by the brain, or that scientists now understand all of nature's important forces. Such assumptions are not science, but philosophical assumptions – dubious and unproven philosophical assumptions that should not at all be used as some "reality filter" to restrict our considerations.

Cultivating prejudice and ridicule towards all paranormal phenomena is part of the strategy used by the proponents of the Blind Chance dogma. It is a clever way of trying to shut the door to half of the evidence for cosmic purpose. But observations of paranormal phenomena should be taken as seriously as any other observations, as long as they come from credible sources, and are collected in a careful and systematic way by credible persons. There are large classes of paranormal phenomena that have been studied in exactly such a way for many years. One example is extrasensory perception (ESP), which has been carefully and systematically studied by scientists for more than a century, with abundant experimentation under controlled scientific conditions. A more recent example is near-death experiences, which have been systematically recorded in scientific journals for decades, in papers often written by physicians. There is no reason why such observations should be excluded merely on the grounds that they are paranormal.

So in listing and examining the abundant hints of cosmic purpose, I will be considering a wide spectrum of phenomena, including both phenomena discussed by physicists and phenomena involving direct human observations. Some of the items I will discuss seem like very strong signs of cosmic purpose, more than just hints. I include them in a book entitled "50 Hints of Cosmic Purpose" simply to avoid a longer book title such as "50 Signs or Hints of Cosmic Purpose." Other items on my list are weaker hints. I do not ask the reader to accept the reality of every single item that I will discuss. Perhaps a few of them are false alarms. But by the time you finish reading this book, you will have been given dozens of hints of cosmic purpose, a list so extensive that it will add up to a very strong case that there really is a plan behind it all, a "grand scheme of things" worked out by some higher intelligence.

What is the nature of such an intelligence? Is it the deity described by conventional theology? Or is it some different deity, perhaps some mysterious God of the universe? Could it be that more than one great Mind is involved in determining the universe's purpose? Could it be that

some mysterious programming or information system is somehow leading the universe towards goals? Or could the entire universe itself be an intelligent system or an intelligent being?

I will make no attempts to answer such questions. This is not a book designed to get you to believe in some particular religious creed, and this book's consideration are compatible with a wide variety of existing creeds. My purpose is simply to list and describe the abundant reasons for believing that there is a purpose behind the universe, and that the universe reflects the plan or design of some great intelligence. After seeing the evidence for this very general idea, you can fill in the details in whatever way you want, or just say to yourself: it is too early for us to fill in the details.

In the discussion that follows, any evidence for life after death will be treated as equivalent to an indication of cosmic purpose. This is partially because no one has ever come up with a remotely plausible idea or theory as to how life after death could exist in the purposeless universe imagined by the Blind Chance dogma. If no one designed the universe, and no intelligence or plan is behind it, and there is no purpose to the universe, then there is not the slightest reason to think that any such thing as life after death would occur. So it is right to regard any evidence for life after death as being a hint of cosmic purpose.

So I will now begin my list of "50 Hints of Cosmic Purpose." This book will consist of 50 numbered chapters. When I refer to some particular scientific paper or some person's account or some particular incident, I will typically give a reference that the reader can examine to get more information on the topic. Rather than cluttering up the text with these references, I will put them all at the end of this book. I will not bother to include references in many cases when you can find information about the topic by just doing a Google search for it.

1. The Exact Equality of the Proton Charge and the Electron Charge

Here is an interesting experiment to try on any friend of yours who does not know very much about physics.

1. Ask your friend: guess what is the ratio between the mass of a proton and the mass of an electron. After hearing an answer, tell your friend each proton is 1836 times more massive than each electron.
2. Now ask your friend: guess what is the ratio between the electrical charge of a proton and the electrical charge of an electron.

I would think that the average person (having just heard that protons are 1836 times more massive than electrons) would guess that the electrical charge of a proton is much greater than the electrical charge of an electron – perhaps 1836 times greater, or at least a thousand or a hundred times greater. That would be a good "common sense" conclusion, since we typically observe larger things having larger electrical charges than smaller things.

But such a "common sense" conclusion would be false. The actual fact observed by scientists is that each proton has a charge that is exactly the same as each electron, but with an opposite sign. Each proton has a charge of $+1.60217657 \times 10^{-19}$ coulomb, and each electron has a charge of $-1.60217657 \times 10^{-19}$ coulomb.

RATIO OF PROTON MASS TO ELECTRON MASS:
1836.152672
RATIO OF PROTON CHARGE TO ELECTRON CHARGE:
1.000000000000000

An experiment done by J. G. King showed that the magnitude of the proton charge matches the magnitude of the electron charge to 1 part in 100,000,000,000,000,000,000. A scientific paper by Zorn, Chamberlain, and Hayes used a molecular beam deflection method to conclude that the proton charge and the electron charge have a magnitude differing by less than 1 part in 1,000,000,000,000,000,000.

This amazing coincidence is unexplained by modern science. It is also a coincidence on which our existence depends. Scientists say that if the charge on the electron differed by only one part in a billion billion from the charge of the proton, our planet could not hold together, and we would not be here.

To see why this is true, we need merely consider the following facts. Our planet is held together by gravity. Gravitation is one of the four fundamental forces in the universe, but it is roughly a billion billion billion

billion (1,000,000,000,000,000,000,000,000,000,000,000,000) times *weaker* than the electromagnetic force, another of the four fundamental forces, the force between electric charges. Even changing the electron charge by 1 part in a billion billion (1 part in 1,000,000,000,000,000,000) would create electromagnetic repulsion effects that would be something very roughly like a billion billion times larger than the gravitational effects holding our planet together. The result, according to astronomer George Greenstein, would be that our planet would fly apart in pieces.

Similarly, according to a scientific paper by Sengupta and Pal, if the electron charge and the proton charge differed by less than 1 part in a billion billion billion (1 part in 1,000,000,000,000,000,000,000,000,000), it would produce cosmological effects that would have already been noticed, but have not been noticed.

What is the likelihood of the electron charge and the proton charge having exactly the same magnitude merely because of a coincidence, with an equality as close as the equality that has been measured in the studies mentioned above? The chance of this is about as likely as you meeting a stranger and correctly guessing that person's social security number, phone number, and birth day, with all three guesses being an exact match. Such a coincidence would have a likelihood of 1 in 100,000,000,000,000,000,000, and we know that the magnitude of the electron charge and the proton charge match that closely, even though each proton is 1836 times more massive than each electron.

The exact equality of the proton charge and the electron charge is one of the most dramatic pieces of evidence that our universe was deliberately designed. One is almost tempted to call such an exact equality "the signature of God." This is more than just a hint of cosmic purpose – it is a 100 decibel *scream* of cosmic purpose.

2. Crisis Apparitions

A crisis apparition is a sighting of a ghost or apparition at about the time of a person's death, often a short time after that death. In recent years quite a few accomplished people have gone on television to claim that they saw such an apparition at the time of a relative's death, or some time later. Many such claims have been made on the long-running television series *Celebrity Ghost Stories*.

If one wants to find a more scientific and systematic documentation of such apparitions, there is certainly one two-volume work that fits that bill. The work is *Phantasms of the Living*, a two-volume 1400-page opus published in the late nineteenth century. The main author was Edmund

Gurney, editor of the Proceedings of the Society for Psychical Research, a long-standing British institution which has taken a rigorously systematic and methodical approach to documenting paranormal phenomena. Assisted by F.W.H Myers and Frank Podmore, Gurney accumulated more than 700 accounts of apparitions, and in most cases was able to get some form of corroboration, such as accounts written at the time of the sighting, direct testimony from the person who saw the apparition, death records, or the testimony of another person who confirmed the original account. Gurney was almost obsessive about gathering every available scrap of information he could find to corroborate the apparition accounts he listed.

Here are some randomly chosen examples of the cases in *Phantasms of the Living*:

Case #226: A British general stationed in India saw an apparition of his sister. Later he found that his sister had died at the same time the apparition was seen.

Case #228: Frederick Barker reported that on December 6, 1873 (after just speaking with his wife) he suddenly saw an apparition of his aunt, currently living far away. A week later he heard that his aunt had died on the same night he saw the apparition. Gurney got a confirming account from the man's wife, and an obituary stating that the woman had died on the night in question, and an account from another person stating that the aunt had frequently expressed a wish to see Frederick in her last days.

Case #237: Ellen Greany reported that she saw a dear old friend of hers in her room while Ellen's mother was there, facing in a different direction. An instant later there was no sign of the friend. The next day Ellen found out that her friend had died the previous day. Her mother confirmed the account. Ellen was cross examined by Gurney, who found she held up well to interrogation.

Case #251: A child went out to play. A short time later, her father reported seeing his child enter the house as a “bright shadow,” “like a flash of lightning in the form of a child's shadow.” Within a few minutes the father learned his child had been run over in a fatal accident.

In his “Survey of Claimed Encounters With the Dead,” Erlendur Haraldsson reported five cases of crisis-apparitions (which he defined as “when an apparition is seen close to the time of the agent’s death (technically, within twelve hours before or after) without the percipient knowing that this person is about to die or has died,”) in addition to numerous other types of apparitions.

Some more recent accounts of crisis apparitions are contained in a CNN story entitled “Do loved ones bid farewell from beyond the grave?”

The CNN story mentions that Josh Harris reports that his grandfather appeared with a whitish glow, when he thought his grandfather was two miles away. Harris says the apparition disappeared. A few moments later, Harris was informed by his aunt that she just received a phone call notifying her Harris' grandfather had died.

The same CNN story says Nina De Santo reported a customer coming to her salon just before closing. They had a pleasant little talk. Nina later learned that nine hours before this meeting, the customer had committed suicide.

In the book *The Gift* co-authored by Sally Rhine Feather, we have a report of a woman who saw the room illuminated by a strange light. She saw her mother, and moved toward her; “but she disappeared, light and all.” A few hours later she got a call saying that her mother had died.
In the same book, there is an account of a father in the United States who was surprised to see his son in uniform, a son who he thought was in France. The son then disappeared. The father learned a week later that his son had died in France.

One of the most unusual stories of a crisis apparition is the story of how L.A. Goodeve was visited by not one but three different ghosts who asked her to help right an old wrong. The case (sometimes called “the Snettisham ghost case”) is called “one of the best attested cases on record,” by Rodger I. Anderson.

As they are particularly difficult to explain under any theory of hallucinations (with so many coincidences between a time of death and the sighting of the apparition), crisis apparitions provide substantial evidence for life after death, and are therefore a hint of cosmic purpose.

3. The Sudden Origin of the Universe in a Primordial Singularity

For quite a while in the nineteenth century and much of the twentieth century, scientists assumed that the universe has existed forever. An example of a scientific theory which assumed an eternal universe is the steady-state theory advanced by astronomer Fred Hoyle around 1955. Hoyle thought that matter appeared between galaxies to form the basis of new galaxies, and that the universe has existed forever in its current state.

But by the mid-1960's astronomers had discarded such a theory in favor of the Big Bang theory, the idea that the universe had a sudden origin in an

unfathomably dense and hot state. One main line of evidence for such an idea was the fact that the universe is expanding, meaning that the distance between galaxies is increasing as time passes. If you mentally "rewind the film" on an expanding universe, and rewind all the way back, you are forced to consider an original moment when all the matter of the universe was packed together in a dense state.

Another line of evidence for the Big Bang is the cosmic background radiation, a type of microwave radiation that pervades all of space. This radiation has special characteristics that match the predictions of the Big Bang theory. In fact, a Big Bang theorist named Ralph Alpherin predicted that the cosmic background radiation would be discovered, years before it was discovered. Still another line of evidence for the Big Bang is that its predictions about the distribution of elements in our universe matches the observed distribution (despite an outstanding issue with the prediction regarding the element lithium).

When the Big Bang theory was combined with Einstein's well-confirmed theory of general relativity, scientists came to a shocking conclusion. The conclusion was not merely that the universe had a sudden origin 13 billion years ago. The conclusion was also that the universe had originated in an infinitely small and dense state called a singularity. Imagining a universe that appears from a Big Bang singularity is basically the same as imagining a universe that suddenly appears out of nothing. The concept bears an eerie resemblance to the theological notion of *creation ex nihilo*, the creation of the universe out of nothing by God.

Scientists say a singularity is something where the laws of physics break down, as they do when a star collapses into a singularity to become a black hole. The idea of an orderly universe emerging from a singularity seems almost unthinkable, unless there was some divine hand behind such an event. As a Science Daily article says, "The big bang hypothesis has our relatively comprehensible, uniform, and predictable universe arising from the physics-destroying insanity of a singularity. It seems unlikely."

The current description of the origin of the universe is one that very strongly suggests a deliberate creation of the universe by some supernatural power. It is basically impossible to imagine any scientific description of the origin of the universe that could be any more suggestive of a divine creation (you can imagine our current universe suddenly popping into existence, but that would not be a scientific description). This particular "hint of cosmic purpose" seems more like a signature or fingerprint of cosmic purpose.

4. Visions of Those Who Died

Deathbed visions are a phenomenon different from near-death experiences. A near-death experience can be described as a paranormal account given by a person who had a close encounter with death, nearly dying in the process. A deathbed vision can be described as a paranormal account by a person who actually died, an account given just before he died. Deathbed visions may have been first described in *Deathbed Visions*, by Sir William Barrett, published in 1926 (long before Raymond Moody's 1975 book *Life After Life*, which first examined near-death experiences).

Barrett recorded many cases of dying people who said that they saw dead people on their deathbeds, most commonly relatives who had died. Near the beginning of Chapter 3, he stated, "There are a great many records authenticated by those who have attended the last moments of a dying friend or patient, wherein shortly before death an ecstatic vision seems to have been granted to the dying person, whose face lights up with joy and apparent recognition of some relative before he passes into the Unseen." Barrett's book supplies many such accounts.

One can read the whole book online by using this URL:
http://www.survivalafterdeath.info/books/barrett/dbv/contents.htm

Here is one account from chapter 3 of the book, taken from the Journal of the American Society for Psychical Research for July, 1909 (page 422):

Since I last wrote to you our fond aunt, Louisa Browning, died on Sunday morning, October 28th, at the age of 78. On her death-bed she appeared to see her deeply loved sister [Capt. Ericsson's wife, Amelia], who had gone before. Those watching by her heard her say - though she had before been quite unconscious - 'Oh, Amelia! Amelia!' and she reached out her hand to welcome someone their earthly eyes were not permitted to see, and then all was over...

Here is another account from the book, concerning the death of two girls, Minnie and Ada:

The doctor called in pronounced their complaint to be small-pox of the most malignant kind. They both died within the week, but the youngest, Minnie, died first. The day after she was buried, the poor bereaved mother was anxiously watching the last hours of the one still left, for whom she well knew no chance of life remained. Suddenly the sick child woke up from a kind of stupor, and exclaimed, 'Oh, look, Mamma, look at the beautiful angels!' pointing to the foot of the bed. Mrs. G. saw nothing, but heard soft sweet music, which seemed to float in the air. Again the child exclaimed: 'Oh, dear Mamma, there is Minnie! She has come for me'; she

smiled and appeared greatly pleased. At this moment Mrs. G. distinctly heard a voice say, 'Come, dear Ada, I am waiting for you!' The sick child smiled once again and died without a struggle.

The biggest study of deathbed visions was the research published in the 1997 book *At the Hour of Death* by Dr Karlis Osis and Dr Erlendur Haraldsson. Osis and Haraldsson studied 442 deathbed visions in the United States and 435 in India (of which 163 recovered). The most common type of vision (471) were those of other people, two thirds of which were of people who had already died. "The majority (two thirds) of apparitions portray dead people rather than living people," the authors noted. "The opposite has been found to be true of hallucinations by persons in normal health." 91 percent of those identified by the dying person during a deathbed vision were dead relatives of the dying person. Another common type of vision was that of some other world or realm. A rise of mood to serenity or elation was reported in 174 of the cases. The study estimated that only ten percent of people are awake when they die, and that within this group, one-half to two thirds have deathbed visions.

The study found that these deathbed visions were very similar in India and the United States. "Great beauty and peace dominated visions in both cultures (United States, 82 percent; India, 94 percent)," said the authors. "Experiences in both countries are basically similar."

The account below is a typical one from Osis and Haraldsson's study:

A sixty-five-year-old American (male) cancer patient seemed to be clear and rational in his thinking, but "saw the other world." He looked into the distance, these things would appear to him, seemed real to him. He would look up at the wall, eyes and face would brighten up as if he saw a person – he'd speak of the light and brightness. He saw people who seemed real to him, and "Hello," and "there's my mother." He gestured, stretched out his hands after it was over, closed his eyes and seemed very peaceful. Before the hallucination he was very ill, nauseous; after it he was serene and peaceful.

Visions of those who died suggest the existence of an afterlife, something that we should expect to exist only in a purposeful universe.

5. The Fine Tuning of the Cosmological Constant (Vacuum Energy Density)

We tend to think of science as something that gives us the right answers. Almost always science does give us the right answer. But there is at least

one case when science gives us the wrong answer – a *really, really* wrong answer. In fact, there is one case in which science gives us an answer wronger than any answer that you ever gave in school, even on those tests when you wrote wild guesses on your exam sheet because you had daydreamed through every class session.

The wrong answer given by science is the answer that it gives to the question: how much energy is in a vacuum?

A person not familiar with quantum mechanics tends to think of a vacuum as being just empty space. But according to quantum mechanics, empty space is not really empty. It is instead a seething froth of very short-lived particles called virtual particles. A virtual particle with mass is a particle that pops into existence and then pops out of existence a tiny fraction of a second later. Scientist think that the vacuum is filled with virtual particles corresponding to every type of actual subatomic particle that has been discovered. For example, they think that the vacuum includes incredibly short-lived virtual electrons, and incredibly short-lived virtual quarks (because both electrons and quarks are known types of subatomic particles).

Imagine if there was a weird rule in your living room that every second 10,000 fireflies had to pop into existence, but that each of them would disappear a fraction of a second later. You might then then see in your living room these weird little streaks of motion and flashes that would be the signs of short-lived fireflies existing for an instant before disappearing. Scientists think that the vacuum of space is a little like that, except that the fireflies are subatomic virtual particles, so we can't see anything like the streaks and flashes.

Quantum field theory allows us to calculate how much energy there should be in the vacuum of space because of these virtual particles. The problem is that when scientists do the calculations, they get a number that is ridiculously wrong. According to a UCLA astronomer, quantum field theory gives a prediction that every cubic centimeter of the vacuum should have an energy density of 10^{91} grams. This number is 10 followed by 90 zeroes. That is an amount trillions of times greater than the mass of the entire observable universe, which is estimated to be only about 10^{56} grams.

This means that according to quantum field theory, every cubic centimeter of empty space should have more mass-energy than all the mass-energy in the entire observable universe.

How far off is this calculation? It varies on how you do the calculations.

According to one type of calculation, the predictions of quantum field theory is wrong by a factor of 10^{60}, which is a factor of a trillion trillion trillion trillion trillion times. According to a different way of estimating it, the predictions of quantum field theory is wrong by a factor of 10^{120}, which is a factor of a million billion quadrillion quintillion sextillion septillion octillion times.

This prediction has been repeatedly referred to as the worst prediction in the history of physics. It could just as well be called the most wrong prediction in the history of human thought. No zealous apocalyptic doomer ever made a prediction more wrong, not even the preacher who predicted the end of the world would occur in 1843.

When physicists discuss this matter, they refer to it as the vacuum catastrophe or the cosmological constant problem. Scientists think that the vacuum does have a very slight energy density (believed to be the main driver of what is called the cosmological constant, which is causing the universe's expansion to accelerate). But that energy density is less than .0000000000000000000000000000000001 percent of the amount predicted by quantum field theory.

Now it might be easy for us to just dismiss quantum mechanics, because of this ridiculously wrong prediction – we could just say, “This just shows that quantum mechanics is all wrong.” But the problem is that quantum mechanics makes many other specific predictions that turn out to be exactly right. So scientists have to try to struggle towards some guess as to how quantum mechanics could be right despite its very wrong prediction about the energy density of the vacuum.

One idea Professor Matt Strassler has discussed is that the energy of the virtual particles related to bosons (one class of subatomic particles) is positive, and the energy of the virtual particles related to fermions (another class of subatomic particles) is negative. Could it be that these two somehow nearly cancel out each other, resulting in a vacuum with almost no energy density? But as Strassler points out, this doesn't work out, because there are “way too many fermions.”

Another problem is that for you to have an exact balance of positive and negative contributions to the vacuum energy density would require fine-tuning of about 1 part in 10^{60}, which is 1 part in trillion trillion trillion trillion trillion times.

It could conceivably be that there are many additional undiscovered types of subatomic particles. It could also be that when one adds up the positive

energy from all of the virtual particles corresponding to these particles, and subtracts from that the negative energy from all of the virtual particles corresponding to these particles, one ends up with a vacuum energy density of zero or almost zero. But that would require an incredibly improbable coincidence, one which randomly would have less than 1 chance in 1,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000. It would be like the chance of you adding up all the money earned on planet Earth, comparing it to all the money borrowed, spent or charged on credit cards, and finding that the two sums matched exactly, to the penny – but it would be far more improbable.

If such a coincidence has occurred, then scientists are using the wrong term to discuss this problem. They use the term "the vacuum catastrophe," but the word catastrophe means something very bad. The fact that the vacuum is not even .0000000000000000000000000001 percent as large as predicted by quantum field theory, is however, something that is very good, because a very low vacuum energy density is necessary for our existence. If the vacuum energy density was even a trillionth of a trillionth as large as predicted by quantum field theory, empty space everywhere would be far denser than steel, and intelligent life never could have appeared in the universe. There would be many reasons why suns could never have formed, and if they did exist, the super-dense vacuum would block all sunlight from ever reaching planets.

What is the proper term for an incredibly improbable but fortunate occurrence? The term is miracle. One definition of miracle is simply a very fortunate but very unlikely event, as in "the miracle of the jet landing on the Hudson River," or "the miracle that no one was killed by the bomb."

So rather than using the term "the vacuum catastrophe" to describe this extreme fine-tuning of the cosmological constant (the vacuum energy density), it is more appropriate to use the term "the vacuum miracle." It is a understatement to call this "vacuum miracle" a hint of cosmic purpose. It seems more appropriate to call it an overwhelming signature of cosmic purpose, a signature almost as dramatic as anything we might hope to find in nature. The extreme fine-tuning of the vacuum energy density strongly suggests that there is an astonishing balancing act in the basis design of the universe, a balancing act no less amazing than we would see if the Empire State Building was balanced on its spire rather than its base.

6. Mental Mediumship

A mental medium is a person who claims to be able to make contact with a dead person. Some mental mediums claim to be able to contact the dead through clairvoyance or telepathy. Other mental mediums are what are called trance mediums. A trance medium goes into an altered state of consciousness called a trance. During this state, the trance medium may speak in a different-sounding voice, a voice that claims to be coming directly from what is called a spirit guide or spirit control.

Some alleged mental mediums have been fakes who have been exposed by careful inquiry. But there have been other mental mediums who have stood up very well to scientific investigation. One such medium was Leonora Piper. Piper was investigated by the eminent psychologist William James (called "the father of American psychology"), who declared that she was producing authentic paranormal phenomena. She was investigated at greater length by a skeptic named Richard Hodgson, who started out with the intention of debunking her. Hodgson was startled when Piper described events from Hodgson's childhood that should have been unknown to her. Hodgson paid for private investigators to secretly follow Piper, hoping to find some evidence of a secret network of assistants. But he found nothing of the sort.

Hodgson studied Piper for years, and eventually the former arch-skeptic concluded that she was authentic, and was actually in contact with spirits of the dead. Piper was investigated by scientists for more than 10 years, and was never found guilty of any fraud.

Piper would go into a trance, and then speak in some different voice, as a person claiming to be a dead person: a "spirit control." At one time her "spirit control" claimed to be the late psychic researcher and classical scholar F. W. H. Myers. The "spirit control" was asked by someone watching Piper (George Dorr) what the word "Lethe" meant. The "spirit control" then spoke a list of obscure classical references mostly related to the ancient Latin poem *Metamorphoses* by Ovid. The highly esoteric and erudite references were of a type that only a classical scholar such as Myers could have produced, and Piper was certainly not such a scholar. The incident was notable as one that seems to exclude any chance that Piper was mind-reading someone in the room, as no one in the room was a classical scholar. This incident is known as the "Lethe case."

The same question (the meaning of "Lethe") was posed to another medium (Mrs. Willett) who claimed to be in touch with the spirit of F.W.H. Myers. Again, a stream of obscure classical references was produced, but this time related to a different classic Latin work, the *Aeneid* of Virgil. Again, there seemed to be no chance that the medium would have been able to produce the highly erudite references requiring a mastery of ancient Latin

literature.

Some people think that Gladys Osborne Leonard was an even more successful mental medium than Leonora Piper. On December 3, 1915 Leonard gave a description of a photograph taken of Raymond Lodge, the recently deceased son of the scientist Sir Oliver Lodge. The photograph was described as a group picture in which Raymond was sitting on the ground, with another officer putting his hand on Raymond's shoulder. Four days later Oliver Lodge received the photo in the mail, which matched the description exactly. Lodge thought the matter so evidential that he wrote a book about it entitled *Raymond, or Life and Death*.

Charles Drayton Thomas carried out a long series of tests with Leonard, tests that are known as the "book and newspaper tests." Some regard these tests as some of the most convincing evidence of life after death ever produced. In the book tests, Leonard's "spirit control" (supposedly the dead father of Thomas) would be asked to identify information in books in his son's library. The "spirit control" would then make statements such as a request to go to the lowest shelf near the window and choose the sixth book on the left, opening it to page 149. The "spirit control" would then identify some words or some phrase found there. Over two years, 348 of these book tests were carried out. 242 were judged to be successful, 46 indefinite, and 60 failures. Later Leonard's "spirit control" was asked to foretell the pages of future newspapers. Many of the tests were remarkably successful.

The one contemporary mental medium I have seen in action is Theresa Caputo, who has been on television for years in the cable TV reality series *Long Island Medium*. Caputo claims to contact dead people through something like telepathy or clairvoyance. Caputo has been televised many dozens of times coming up with intimate details of the lives and relatives of people she encounters, details she seemingly would have been unable to know through natural means. Many examples can be seen by searching for her name on www.youtube.com.

In this century Harvard graduate Gary Schwartz PhD did a series of tests with mental mediums. In one test he used a novel "triple-blind" technique that may have been more rigorous than "double blind" studies used for pharmaceutical testing. Both mediums and a control group of ordinary people were tested for their ability to acquire information about dead people. The group of mediums outperformed the control group, getting an average rating of 3.56, much higher than the control group, which had an average rating of 1.94. The study made the following conclusion:

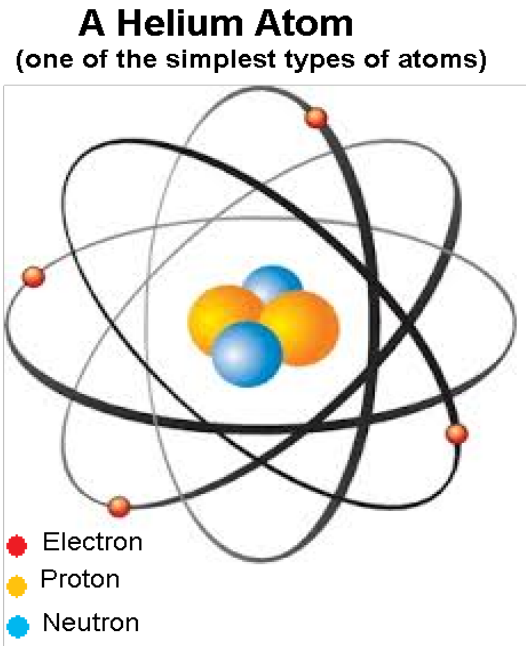
The results suggest that certain mediums can anomalously receive

accurate information about deceased individuals. The study design effectively eliminates conventional mechanisms as well as telepathy as explanations for the information reception, but the results cannot distinguish among alternative paranormal hypotheses, such as survival of consciousness (the continued existence, separate from the body, of an individual's consciousness or personality after physical death) and super-psi (or super-ESP; retrieval of information via a psychic channel or quantum field).

The most convincing evidence from mental mediumship seems to provide substantial evidence for life after death, something that doesn't fit into any theory of a purposeless universe. Such evidence is therefore a hint of cosmic purpose.

7. The Fine-Tuning of the Strong Nuclear Force

Matter is made of atoms, and the nucleus of an atom consists of two types of particles: protons with a positive electric charge, and neutrons with no electric charge. All particles with the same type of electric charge repel each other, and the closer the particles are to each other, the stronger that repulsion is. Since the protons in the atomic nucleus are very close to each other, there is an enormous force of electrical repulsion between them. Were it not for a special feature of nature called the strong nuclear force, there could be no atomic nuclei with more than one proton. The result would be a universe in which there was only one type of element, the element hydrogen (which has a nucleus consisting of only one proton).



Fortunately nature has a feature that overcomes this difficulty. The feature is called the strong nuclear force, and is one of what scientists call the four fundamental forces of nature. The strong nuclear force is a kind of "glue force" that acts between all protons and neutrons when they are very close together. The force has an extremely short range, so it acts in a completely different way from other fundamental forces such as gravitation and electromagnetism, which have an unlimited range. The strong nuclear force is about 100 times stronger than the electromagnetic force. So even though there is a very strong electromagnetic force of repulsion between all protons in an atom, tending to cause them to repel, there is an even stronger force of attraction between them (the strong nuclear force). Because of this force, we have atoms which can have as many as 100 protons or more.

One remarkable thing about the strong nuclear force is that it is fine-tuned. This means that if the strong nuclear force were much stronger or weaker, the universe would not be as suitable for living beings as it is now. If the strong nuclear force were only 2% stronger, then there would exist a type of atomic nucleus that does not exist in our universe, a nucleus called the diproton consisting of two protons and no neutrons. In that case, nuclear fusion in stars would occur at a vastly faster rate, rather than the slow, steady rate we see in stars like our sun. The result is that stars like the sun probably could not exist. An increase of about 10% in the strong nuclear force would also mess up things up so that the universe would not have an abundance of carbon and oxygen, due to the delicate requirements of these element's nuclear resonances. A slighter larger increase would make possible atomic nuclei of almost unlimited size, which would be utterly disastrous for the possibility of life in the universe.

There is also a reason why the universe would not be as suitable for living beings if the strong nuclear force were slightly weaker. If the strong nuclear force were about 25% weaker, there would be a huge increase in radioactivity, an increase so great that people would be unlikely to live as long as 40 or 50 years before dying of cancer. The physicist Paul Davies has said that if the strong nuclear force were 50% weaker, "nuclei such as iron, or even carbon, would be unlikely to survive for long." Davies also notes that if the strong nuclear force were 5% weaker, the deuteron could not exist, which would prevent the main nuclear reaction used by the sun, making the existence of stars like the sun doubtful.

In a scientific paper entitled "Fine-tuning the basic forces of nature through the triple-alpha process in red giant stars," Csoto, Oberhummer, and Schlattl declared this about the strong nuclear force (which they referred to by the alternate name of the N-N interaction):

A 0.5% change in the N-N interaction strength would lead to a Universe which does not contain an appreciable amount of carbon or oxygen. This would make the existence of carbon-based life highly unlikely.

So what we have is a fine-tuned strong nuclear force. It's another case of one of nature's arrows hitting the bullseye, another case of nature landing the golf ball in the golf ball hole. A force that could have had any value between .0000000000001 of its current value or 1000000000 times greater than its current value happens to have a value within the very narrow range that is consistent with a universe in which stars burn slowly and steadily for billions for years, a universe in which intelligent life can evolve, and a universe in which beings like us can exist and live to an old age. The odds of this occurring by chance are very low. So the fine-tuned strong nuclear force we see in our universe is another hint of cosmic purpose.

8. Typical Near Death Experiences

Some uncommon types of near-death experiences will be discussed later. For now, let's just look at the most typical types. A near-death experience is when a person has a close call with death, and reports some unusual vision or psychic experience. The phenomenon of near-death experiences was first popularized in the 1970's by Dr. Raymond Moody in his book *Life After Life,* but the earliest near-death experience reports date back much earlier.

Here is how near-death experiences (NDE) are described by the web site of the International Association for Near-Death Studies (www.iands.org):

More than 15 common characteristics of an NDE have been reported by near-death experiencers. An NDE may include only one or two of these elements, and, in a few cases, all of them. These include: a sense of being outside one's physical body, sometimes perceiving it from an outside position; a sense of movement through darkness or a tunnel; intense emotions; heightened perceptions; experiencing a great light or darkness; perceiving a spiritual realm, which may include vividly memorable landscapes; encounters with deceased loved ones, spiritual beings and/or religious figures; knowledge of the nature of the universe; a life review; a sense of oneness and interconnectedness; a border of no return; a sense of having knowledge of the future; messages regarding life's purpose...The most commonly reported type of NDE involves intense feelings of peace, joy and love, often an encounter with an unconditionally loving light.

In his book Life After Life, Dr. Raymond Moody gives the following composite description of common characteristics of a near-death

experience, mentioning that most have only some of these elements:

"*A man is dying and, as he reaches the point of greatest physical distress, he hears himself pronounced dead by his doctor. He begins to hear an uncomfortable noise, a loud ringing or buzzing, and at the same time feels himself moving very rapidly through a long dark tunnel. After this, he suddenly finds himself outside of his own physical body, but still in the immediate physical environment, and he sees his own body from a distance, as though he is a spectator. He watches the resuscitation attempt from this unusual vantage point and is in a state of emotional upheaval. After a while, he collects himself and becomes more accustomed to his odd condition. He notices that he still has a 'body' but one of a very different nature and with very different powers from the physical body he has left behind. Soon other things begin to happen. Others come to meet and to help him. He glimpses the spirits of relatives and friends who have already died, and a loving, warm spirit of a kind he has never encountered before - a being of light - appears before him. This being asks him a question, nonverbally, to make him evaluate his life and helps him along by showing him a panoramic, instantaneous playback of the major events of his life. At some point he finds himself approaching some sort of barrier or border, apparently representing the limit between earthly life and the next life. Yet, he finds that he must go, back to the earth, that the time for his death has not yet come. At this point he resists, for by now he is taken up with his experiences in the afterlife and does not want to return. He is overwhelmed by intense feelings of joy, love, and peace. Despite his attitude, though, he somehow reunites with his physical body and lives*."

A Gallup poll indicated that about one third of Americans who have been resuscitated have had a near-death experience. Another Gallup poll indicated that 8 million Americans have had near-death experiences. Near-death experiences are experienced across the globe. Reports of such experiences in Asian countries tend to match Western reports in the sense that both commonly involve a feeling of great joy and peace, a visit to some non-earthly realm or landscape, and an encounter with dead relatives or spiritual figures. Western accounts of traveling through a tunnel seem to be much less common in Eastern accounts.

Can we naturally account for near-death experiences through some explanation that would satisfy a materialist skeptic? The most common explanation put forth by materialists is that near-death experiences are hallucinations of a dying brain. One common explanation is that they are caused by oxygen deprivation.

Oxygen starvation (cerebral hypoxia) is a condition well-understood, as it is sometimes produced in pilots and mountain climbers. Medical

references on hypoxia do not typically list hallucinations as a symptom. The symptoms of hypoxia listed here in a Federal Aviation Administration publication are “increased breathing rate, headache, lightheadedness, dizziness, tingling or warm sensations, sweating, poor coordination, impaired judgment, tunnel vision, and euphoria.” Tunnel vision is a phenomenon where you can only see what's in the center of your field of view, and is something entirely different from seeing yourself pulled through a tunnel, often reported in near-death experiences. So the only item on this list of symptoms matching what is reported in near-death experiences is euphoria. In short, oxygen deprivation is not a plausible explanation for near-death experiences. An RAF pilot named Allan Pring experienced oxygen deprivation while flying, and also much later experienced a near-death experience. He reported there was “no similarity” between the two.

A study was done on the physical conditions of some patients who had near-death experiences.
It said, “It was interesting that patients in the study group had higher oxygen
levels than those in the control group...the findings suggest that in this cardiac arrest model, cerebral anoxia may not be an important causative factor in these experiences, and indeed may mitigate against them.”

But what about that recent study involving near-death experiences and rats? The study claimed to have detected “correlates of higher consciousness” in dying rats, a phrase carefully chosen to suggest that rats have something like mystical experiences when they die. But these “correlates of higher consciousness” are also simply correlates of paying attention. So articles on this rat study might have just as well have been headlined, “Study Proves Rats Pay Attention When You Kill Them.” Such a study proves nothing.

The hallucination hypothesis to explain near-death experiences is not plausible, because we know that hallucinations are as random as dreams. But those who have near-death experiences do not have random visions. The reports of near-death experiences have a great deal of similarity. The reports are not all exactly the same, but the degree of similarity is much more than we would expect if the experiences were random hallucinations.

There are specific elements that are reported again and again in near-death experiences, such as a strong feeling of joy, the sense of drifting away from the body, the journey through the tunnel, the encounter with a Being of light, the life review, and the encounter with dead relatives. These elements are virtually never reported in dreams or psychiatric hallucinations. Those who have had near-death experiences are almost

unanimous in reporting that they were not hallucinations, but instead experiences that are kind of “realer than real.”

A 2013 scientific paper by 8 neurologists concluded that near-death experiences are better remembered by those who have had them than imagined experiences and ordinary life experiences. The paper said, “These results highlight the point that NDEs seem unique, unrivaled memories.” The paper gave scientific support to the claims of many that their near-death experiences were “realer than life.”

Because near-death experiences provide *prima facie* evidence for life after death and survival of the human soul, they are a powerful hint of cosmic purpose.

9. Veridical Near Death Experiences

Veridical near-death experiences are those in which the account contains narrative elements that were subsequently verified. There have been many such cases.

For example, in 1916 during World War I a doctor was involved in a plane crash. The doctor reported, “Suddenly I was looking down on my body on the ground from some 200 feet vertically above it.” Supposedly he then observed numerous events occurring within a few hundred yards, details which were later verified to be correct.

In another case a salesman named W.A. Laufmann was hospitalized for a grave illness. He says he found himself outside of his body. He said he left the hospital and saw a Mr. Blose, and tried to get his attention; “but my arm went through him.” He noticed Mr. Blose looking at a shop in which a miniature Ferris Wheel was displayed. Laufmann says he contacted Blose, and found that he did indeed look at such a miniature Ferris Wheel at such a time.

In another case a Mrs. R. M. gave this report:

I looked down at my body. I thought I was dead... I wondered where my daughter was and the next instant I was standing beside her in a gift shop. She was looking at some "Get Well" cards. I could "hear" her read the verse. She decided it would be would be disrespecful and bought another. Then I was back in my body. When my daughter came with the card, I repeated the verse she had read.

In another case Al Sullivan in 1988 reported drifting out of his body during an operation. He reported that he saw a surgeon flapping his arms

like a bird. A later inquiry revealed that one of the surgeons in his operation had the habit of making just such a motion, which was distinctive to him.

Two cases of veridical near-death experiences were reported by near-death experience researcher Kenneth Ring, PhD. According to nurse Cathy Milne, a patient said she had a near-death experience in which she floated out of her body, reaching the hospital roof top, where she saw a red shoe. A medical resident had a janitor open the door to the roof, where he found just such a red shoe. The story is similar to a previous account reported by a social worker named Kimberly Clark, regarding a patient named Maria. Maria had claimed to have had a near-death experience in which she floated out of her body, and saw a tennis shoe on a ledge of the hospital's third floor. Clark recovered a tennis shoe matching the description on a ledge of the third floor.

In another veridical near-death experience, a comatose patient was found unconscious in a meadow. He was taken to a hospital and underwent extensive CPR before being put in the intensive care unit. A nurse took out his dentures and put them in a drawer of a cart. Much later the man regained unconsciousness and reported a near-death experience. He reported floating above his body, and observing the nurse put the dentures in the cart drawer. He was thereby able to recover the dentures. The matter was investigated extensively by Rudolf H. Smit, who found that the story matched the medical records and the original interviews.

Perhaps the most impressive veridical near-death experience is that of the late Pam Reynolds. Reynolds underwent an operation for a large brain aneurysm that was life-threatening. To perform the very risky operation, doctors drastically lowered Reynold's temperature, draining blood out of her head. The doctor's taped Reynold's eyes, and put in earplugs which made clicking sounds as loud as a jet airplane taking off, allowing doctors to monitor her brain stem activity.

Reynolds reported that during the operation she underwent a profound near-death experience in which she eventually met her dead grandmother. She says she found herself looking down on the operating table. She identified a distinctive medical instrument used during the operation, one looking like an electric toothbrush. She recalled hearing a doctor say that her veins were too small, and another doctor saying to use another vein. She recalled hearing that a radio was playing the Eagles' song *Hotel California*. An investigation after the operation verified all of these details. It should have been quite impossible for Reynolds to have known these things, because at the time of the operation she should have been in a deep coma, incapable of any perception.

The Pam Reynolds case seems to be doubly significant. For one thing, it is a strong case of an out-of-the-body experience in which observations were verified. For another thing, it is a case that seems to refute the whole idea that near-death experiences are mere hallucinations. Given Reynolds' bodily state during the operation (in a medically induced coma with blood drained from the head and very low body temperature) it should have been quite impossible for anything like a hallucination to have occurred. In such a state scientists expect a brain to produce no consciousness at all.

In 2012 cardiac surgeon Dr. Lloyd Rudy gave a remarkable interview in which he discussed a veridical near-death experience. Rudy operated on a patient who seemed to have died. The patient was connected to monitoring equipment which showed no evidence of a heartbeat for twenty minutes. Convinced the patient was dead, Rudy stood in a doorway with another doctor, discussing if they could have done anything differently to save the patient. Rudy was later startled to see weak signs of a very slow heartbeat on the seemingly dead patient. The heartbeat slowly strengthened. Rudy called for other medical personnel to return, further treatment was rendered, and the patient eventually gained consciousness.

While still in the hospital the patient recalled having a near-death experience in which he floated through a tunnel and saw a bright light. The patient says he floated above his body, and observed his medical care while his heart had stopped. The patient also recalled seeing Dr. Rudy and the other doctor talking in the doorway (something that happened when his heart had been stopped for quite a few minutes). He recalled other parts of the operation, and said that post-it notes had been placed on a monitor during the operation (something that Dr. Rudy confirmed). This case is particularly strong because we have on www.youtube.com first hard testimony by Dr. Rudy himself describing all of this. The link for the video is below:

https://www.youtube.com/embed/JL1oDuvQR08

A skeptic has attempted to naturally explain this video by suggesting that the patient woke up and saw the doctors standing in the doorway. If you watch the video carefully, it is very clear that this could not have happened. The doctor clearly describes a patient who very gradually regains a heartbeat well after the moment when the doctors were standing in the hallway discussing what they could have done differently to save his life. The doctor does not describe the patient regaining consciousness at any time while in the operating room.

In the same video Dr. Rudy recounts another astonishing story of a

different patient who was bleeding uncontrollably. He said suddenly everyone in the operating room felt a mysterious presence. Then the bleeding inexplicably stopped.

The veridical near-death experiences discussed here are powerful evidence for a life after death. They thereby provide yet another hint of a purposeful universe.

10. The Asymmetry of Matter and Antimatter

If we create a table listing all of the massive stable subatomic particles in nature, our list will include the three particles that make up an atom: the proton, the electron, and neutron. The list will also include a particle called the positron (which is known as the antiparticle of the electron), and a particle called the antiproton (known as the antiparticle of the proton). For every type of charged subatomic particle with mass, there is another type of particle with the same mass, but with an opposite charge. Such particles are called antiparticles.

Note that both positrons and antiprotons are completely stable particles which will stay around forever when they exist by themselves undisturbed in nature. In actual practice, however, positrons and antiprotons tend to be quickly destroyed in our universe, because a positron is converted to energy photons whenever it comes into contact with an electron, and an antiproton is converted to energy photons whenever it comes into contact with a proton. (Conversely, an electron and a positron can be produced by a collision of two energy particles called photons, and a proton and antiproton can be produced by a collision of two photons.)

So here is the table listing the stable massive particles in nature that can exist by themselves (I will ignore the “ghost particles” called neutrinos):

Particle Name	Mass	Charge
Electron	$9.10938291 \times 10^{-31}$ kg	$-1.60217657 \times 10^{-19}$ coulombs
Positron	$9.10938291 \times 10^{-31}$ kg	$1.60217657 \times 10^{-19}$ coulombs
Neutron	$1.674927351 \times 10^{-27}$ kg	
Proton	$1.672621777 \times 10^{-27}$ kg	$1.60217657 \times 10^{-19}$ coulombs
Antiproton	$1.672621777 \times 10^{-27}$ kg	$-1.60217657 \times 10^{-19}$ coulombs

The laws of nature have no known preference for matter over antimatter. In other words, nature has no known built-in preference for producing more matter particles than antimatter particles. Using enormous scientific instruments such as the Large Hadron Collider, scientists collide together highly accelerated particles that are almost entirely energy, because they are traveling at incredible speeds. Such collisions produce an equal amount of matter particles (such as protons and electrons) and antimatter particles (such as antiprotons and positrons).

But therein lies a great mystery. If the laws of nature have no preference for matter particles over antimatter particles, we would expect that at the time of the Big Bang there should have been an equal number of matter particles and antimatter particles (in other words, an equal amount of matter and antimatter). At the time of the Big Bang, the universe was like a vastly bigger version of the Large Hadron Collider, because of the incredible heat and density at that time. All those high-energy photons colliding together should have left an equal amount of matter and antimatter. But if that had happened, all of the matter would have combined with antimatter, leaving nothing but energy.

So strangely enough, scientists think it is very surprising that there is any matter at all in the universe. Based on what we know about the laws of nature and the Big Bang, the universe should consist of nothing but energy. Call it the scandal of matter's existence.

Scientists call this problem the mystery of matter/antimatter asymmetry. Science says there should be a symmetry (an exact balance) between

matter and antimatter, but there is no such thing. Instead we have an asymmetry, a non-balance. Scientists have been scratching their heads over this problem for decades, and have got nowhere trying to explain it.

Somehow the laws of nature must have something like a "secret clause" that favors the existence of matter over antimatter. We would not expect such a thing to exist if there was no purpose behind the universe. So the asymmetry of matter over antimatter is another hint of cosmic purpose.

11. Experimental Evidence for ESP

It has long been believed by many that human beings have some kind of immortal soul, or some kind of spiritual capabilities beyond that which can be explained by neuroscience. But skeptics have complained that such a thing cannot be verified by experimental science. While it might be currently impossible or impractical to do experiments proving that there is some soul that survives death, we can do experiments to test whether human beings have paranormal powers, powers that we would not expect them to have unless there was some higher reality to the human personality. One of those powers is extra-sensory perception (ESP), also known as telepathy.

It is sometimes said that systematic experimental work on ESP started out with the work of J.B. Rhine at Duke University, although in truth evidence for the phenomenon has been carefully collected since the 1880's. Rhine conducted tests involving over a million trials. 27 of 33 of his studies produced statistically significant results, including a test with results that had a chance of only 1 in a million.

In 1937 Harold Sherman carried out an impressive ESP experiment with Arctic explorer Sir Hubert Wilkins. For five months the two men would try to "tune in" each other at a particular time of day, while Wilkins was on an Arctic expedition. Both men made a log of the experiment. The logs were then compared when Wilkins returned, and Sherman's impressions were found to be right or near-right 70% of the time.

Some of the most compelling recent evidence for ESP comes from what are called ganzfeld experiments. A ganzfeld experiment is one in which a test for extra-sensory perception is combined with sensory deprivation achieved through methods such as cutting a ping-pong ball in half and taping it over someone's eyes, and having someone wear an earphone transmitting white noise. In these ESP experiments, the expected chance hit rate (matching of a user's selection and a random target) is 25%. But as wikipedia reports, "In 2010, Lance Storm, Patrizio Tressoldi, and Lorenzo Di Risio analyzed 29 ganzfeld studies from 1997 to 2008. Of the 1,498

trials, 483 produced hits, corresponding to a hit rate of 32.2%." That success rate of 32.2% is hugely above the expected by-chance success rate of 25%.

Dean Radin, PhD, gives the following information on the odds of getting results like this by chance:

Storm and his colleagues found in a clearly defined subset of thirty ganzfeld studies that the overall odds against chance were 8.7 billion to 1....Tressoldi found that in a collection of 108 ganzfeld studies, involving a total of 3,650 participants, a conservative Bayesian analysis resulted in odds against chance of 12 billion to 1.

But this year there may be new experimental evidence even more compelling than the ganzfeld studies. In 2014 the biologist Rupert Sheldrake published a paper describing experiments involving ESP and telephone, E-mails, and text messages. It is supposedly not uncommon for people to get a phone call from a distant acquaintance, and to say something like, "Funny, I was just thinking of you." Sheldrake did experiments to try and verify whether there is anything more than just coincidence behind such thoughts.

Sheldrake and Pam Smart tried a phone call test in which participants get a call from one of four different people, and must guess beforehand who the person is. Testing 63 subjects in a total of 570 trials, the average success rate was 40%, hugely above the expected 25% success rate. This 40% success rate had a probability of less than 1 in 1,000,000,000,000,000. Four of the subjects who did best were then retested under rigorous videotaped conditions. In 271 trials, the average hit rate was 45%, even more dramatically above the expected success rate of 25%, with a probability of less than 1 in 1,000,000,000,000.

Sheldrake and Pam Smart also did email experiments in which participants get an e-mail from one of four different people, and must guess beforehand who the person is. Testing 50 subjects in a total of 552 trials, the average success rate was 43%, hugely above the expected 25% success rate. This 43% success rate had a probability of less than 1 in 1,000,000,000,000,000,000. Five of the subjects who did best were then retested under filmed conditions. The average hit rate was 47%, even more dramatically above the expected success rate of 25%.

In India there is an astonishing case of a young autistic girl named Nandana Unnikrishnan who seems to have a degree of telepathy never witnessed before. The child apparently has the ability to read her mother's mind with amazing accuracy. Newspaper reporters sent to investigate the

girl gave her mother an address beginning with 044050799, making sure the child did not see the slip of paper on which the address was written. They watched in astonishment as the child typed the address exactly. The same type of test was tried with a short poem. The child was able to reproduce it, even though the poem had only been given to her mother.

In 2014 Dr. Diane Hennacy Powell presented to the Parapsychological Association a paper entitled "Evidence for Telepathic Communication in a Nonverbal Autistic Child." The paper described filmed experiments with an autistic child named Hayley:

Data from the first session with Therapist A includes 100% accuracy on three out of twenty image descriptions containing up to nine letters each, 60 to 100% accuracy on all three of the five-letter nonsense words, and 100% accuracy on two random numbers: one eight digits and the other nine. Data from the second session with Therapist A includes 100% accuracy on six out of twelve equations with 15 to 19 digits each, 100% accuracy on seven out of 20 image descriptions containing up to six letters, and between 81 to 100% accuracy on sentences of between 18 and 35 letters. Data from the session with Therapist B showed 100% accuracy with five out of twenty random numbers up to six digits in length, and 100% accuracy with five out of twelve image descriptions containing up to six letters. There was no evidence of cueing or fraud.

Accuracy like this is something that no reasonable person can claim to be the result of coincidence.

These are only some of many experiments that have been done indicating the reality of ESP. The complaint that ESP experiments are not replicable is simply not true. Highly significant results have been replicated over and over again. The experimental evidence for ESP is much stronger than quite a few other things that scientists profess belief in.

Is this relevant to the issue of cosmic purpose? It certainly is (which is one reason why believers in a purposeless, random universe are so stubborn about rejecting evidence for ESP). There is really no plausible way to account for ESP under the reductionist theory that the mind is a mere by-product of brain activity, and that all of man's mental capabilities are the result of blind evolution. If your mind is merely the product of neurons in your brain, there is no reason to think that your mind could be able to telepathically send information to some other mind. Evidence for ESP suggests that there is something radically more to the human mind, and that the mind has powers far beyond any that can be accounted for by neuroscience. By pointing to a human capability that can't be explained by evolution theory, evidence for ESP suggests that there is a lot more going

on in the universe than blind evolution. That may not be a very strong sign of cosmic purpose, but at least it is a hint that the universe is purposeful.

12. The Acceleration of the Universe's Expansion

A few years back scientists made a surprising discovery: the finding that the expansion of the universe is accelerating. This came as quite a surprise, because before this cosmic acceleration was discovered, not many cosmologists predicted that the expansion of the universe was speeding up. Most scientists thought before that the expansion of the universe was either occurring at an unchanged rate, or that it was possibly slowing down. The discovery that the expansion of the universe is accelerating resulted in the Nobel Prize in Physics in 2011 for Saul Perlmutter, Brian P. Schmidt, and Adam G. Riess.

To discuss the significance of this finding, we must look at the concept of a cyclical universe. A cyclical universe theory is one that says that the universe passes through a series of phases or cycles, with each cycle being repeated over and over again. Depending on the theory, each cycle may last billions or trillions of years.

The main theory of a cyclical universe which prevailed around 1985 was the theory of an oscillating universe. To understand this theory, you must understand the concept of critical density. Scientists have long said that if the density of the universe in mass-energy is less than a particular density called the critical density, the universe will keep expanding. But if the density of the universe is greater than this critical density, the universe's expansion will one day slow down and then reverse. If that were to happen, the expansion of the universe (in which the distance between galaxies increases) would turn into a contraction of the universe (in which the distance between galaxies decreases). At the end of the period of contraction would be a Big Crunch in which all of the universe ends up crunched together in a very dense state.

The theory of an oscillating universe held that the universe's density was less than this critical density, and that the current expansion of the universe would one day slow down because of a gravitational attraction of the universe's mass-energy. The theory maintained that at some time billions of years in the future, the universe's expansion would turn into contraction, at which point galaxies would then start moving closer towards each other. The theory maintained that this contraction would eventually result in a Big Crunch that would consist of all the matter in the universe collapsing into a hot dense state (kind of a Big Bang in reverse).

But this theory of an oscillating universe did not maintain that this cycle of a Big Bang followed by Big Crunch would happen just once. The theory maintained that this cycle had been occurring forever, and would continue to occur forever.

The theory of an oscillating universe was the one simple and easy-to-understand theory of an eternal cyclical universe consistent with the fact of the universe's expansion. The theory of an oscillating universe was very attractive to many people, because if it were true, it would eliminate the difficulty of explaining the Big Bang. Rather than being a strange one-of-a-kind event (with possible theological implications), the Big Bang would become just a "routine" event that had happened an infinite number of times before.

But the finding that the universe's expansion is accelerating has ruled out the theory of an oscillating universe. If the universe's expansion is accelerating, it means there will be no Big Crunch. An accelerating universe implies that the universe's origin was a unique one-of-a-kind event, not merely the latest in an infinite series of natural events.

Because it corroborates the idea that the universe began in a unique one-of-a-kind event (an event suspiciously suggestive of a divine creation), the discovery of the acceleration of the universe's expansion is another hint of cosmic purpose.

13. The Improbable Origin of Life from Chemicals

Let us now look at one of the great mysteries of the universe, the mystery of the origin of life, something that took place more than three billion years ago, according to scientists.

Some readers may be thinking along these lines: *That's not such a mystery. Given a primordial soup and millions of years of time, there developed some self-replicating molecule. Once you had that, the development of everything else was just a case of things evolving from the simple to the more complex.*

But such a glib explanation glosses over the great difficulties involved in explaining the origin of life on the early Earth. In recent decades scientists have made relatively little progress in solving this problem.

Consider the progress of astronomy during the past 50 years. Since the year 1963 we have seen the discovery of the Big Bang, the discovery that the expansion of the universe is accelerating, and the discovery of more than 1000 extrasolar planets. But without doing a Google search, can you

name one bit of progress that has been made in the past 50 years regarding the origin of life? You probably can't. When most of us think of scientific work on the origin of life, we think back to the Miller experiments involving amino acids, but they were done in the 1950's.

The basic units of life (below the cellular level) are things such as RNA, DNA, and proteins. Proteins are made of building blocks called amino acids. Some proteins are extremely complicated molecules built from very many amino acids. It was calculated long ago that the chance of some of these proteins forming from random combinations of amino acids is incredibly low, even given billions of years. But that's not necessarily a problem, because proteins are formed using the instructions in DNA. A DNA molecule is like a library of recipe books, with each of the recipes being a recipe for making a particular type of protein.

So if there is a mechanism for producing DNA from a chance combination of chemicals, we might have a way of explaining how all those complicated proteins came into existence. Unfortunately it seems DNA molecules appear to be way too complicated to have arisen from a chance combination of their constituent elements of nucleotides (which consist of sugars, phosphates, and nitrogenous bases), without assistance from something more complicated than nucleotides.

So the current leading hypothesis is that the first self-replicating molecule was not DNA but something simpler, presumably some version of RNA. This idea is called the RNA World Hypothesis. The idea is that first there was RNA, and that DNA evolved later. However, the RNA World hypothesis is on shaky ground.

One problem is the difficulty of explaining the origin of all the necessary building blocks. There are reasons for doubting that the ribose sugars, purines, and nucleotides would have existed in sufficient quantity for DNA or RNA to originate.

Let's consider some of the building blocks of RNA and DNA, using the term “prebiotic” to mean before life, and “abiotic” or “abiogenic” to mean “without life”.

Ribose sugars: According to a Wikipedia article, some scientists have concluded that "the backbone of the first genetic material could not have contained ribose or other sugars because of their instability." According to a Harvard science web site, “In experiments ribose could not be made at the necessary quantities that would explain its abundance on early Earth because it was highly unstable.”
Purines: According to one paper, it is hard to explain the abiotic origin of

purines, in a way compatible with the formation of ribose sugars.
Nucleotides: According to a Wikipedia article, there is "No known chemical pathways for the abiogenic synthesis of nucleotides from pyrimidine nucleobases cytosine and uracil under prebiotic conditions."

Then there is a combinatorial problem, the problem of getting anything like RNA or DNA to appear from the building blocks listed above. A scientific paper by Leslie E. Orgel refers to the difficulty of joining together nucleosides (a combination of ribose sugar and pyrimidines or purines) and nucleotides (a nucleoside plus a phosphate). The wikipedia article on the RNA World hypothesis notes that "Joyce and Orgel further argued that nucleotides cannot link unless there is some activation of the phosphate group, whereas the only effective activating groups for this are 'totally implausible in any prebiotic scenario', particularly adenosine triphosphate." Well-known scientist Freeman Dyson has stated, "The results of thirty years of intensive chemical experimentation has shown that prebiotic synthesis of amino acids is easy to simulate in a reducing environment, but prebiotic synthesis of nucleotides is difficult in all environments...If it happened, it happened by some process that none of our chemists have been clever enough to reproduce."

RNA is made of nucleotides, which are made of ribose sugar, phosphates, pyrimidines, and purines. Scientists have not been able to synthesize RNA through a simulation of the early Earth, and in such simulations have not been able to make the simpler nucleotides either.

None of this proves that some miracle occurred when life first originated. But these facts do hint at the idea that either the origin of life received some supernatural help, or the universe was carefully designed in a way to insure that life would originate. If the origin of life was terribly difficult to occur, we have reason to suspect that the laws of nature and constants of nature were deliberately set up to allow this otherwise unlikely occurrence.

14. The Improbable Origin of the Genetic Code

Perhaps the biggest problem involving the origin of life is the problem of accounting for the origin of the genetic code. The genetic code is a symbolic representation system used by all earthly life. It has been called a kind of miniature programming language.

It is fairly easy to explain the basics of how the code works. In the spiral staircase structure of the DNA molecule, the "steps" of the staircase are chemicals called nitrogenous bases: either purines (adenine or guanine) or pyrimidines (cytosine or uracil). Various combinations of three of these chemicals stand for different amino acids (the building blocks of proteins).

For example, if there are three consecutive “steps” in the spiral staircase, and the first is cytosine, the second adenine, and the third guanine, that stands for the amino acid glutamine. There are 63 other cases where a sequence of three nitrogenous bases stands for a particular amino acid.

Imagine if you liked to write down recipes, but you needed to write down many of them on a single piece of paper. You might invent a little “recipe language” in which MK1 stands for a half a cup of milk, MK2 stands for a full cup of milk, FL1 stands for a half a cup of flour, and so forth, with a total of 64 different three-character symbols (and some other characters standing for “end of recipe”). You might then write out recipes very concisely using this little language. That's quite similar to what the genetic code does, except the recipes are stored in the DNA molecule, and the recipes are instructions for making proteins from the building blocks of amino acids.

The big question is: how did this genetic code ever originate? It's hard to imagine it arising through anything like Darwinian evolution, as the genetic code seems to be required from the very beginning of biological evolution.

The genetic code can be considered an example of *code*, the term software developers use for the symbolic instructions they create. The baffling question is: how did nature go from chemicals to code? Code seems like something fundamentally different from chemicals, and the two seem as unrelated as an apple is to a bicycle.

The issue was highlighted by a scientific paper entitled *Chance and Necessity Do Not Explain the Origin of Life* by biologists J.T. Trevors and D.L. Abel:

"Peer-reviewed life-origin literature presupposes that, given enough time, genetic instructions arose via natural events. Thus far, no paper has provided a plausible mechanism for natural-process algorithm-writing...There is an immense gap from prebiotic chemistry and the lifeless Earth to a complex DNA instruction set, code encryption into codonic sequences, and decryption (translation) into amino acid sequences...How did inanimate nature write

(1) the conceptual instructions needed to organize metabolism?

(2) a language/operating system needed to symbolically

represent, record and replicate those instructions?

(3) a bijective coding scheme (a one-to-one correspondence of symbol meaning) with planned redundancy so as to reduce noise pollution between triplet codon "block code" symbols ("bytes") and amino acid symbols?

We could even add a fourth question. How did inanimate nature design and engineer (4) a cell [Turing machine? (Turing, 1936)] capable of implementing those coded instructions?" -- Trevors and Abel

What Trevors and Abel point out is that for life to have got started, there had to have simultaneously been both the genetic code and a cellular framework that would understand the genetic code. It's like in order for you to play a CD, you need not just the CD, but also a CD reader that can read the CD and use its format. The difficulties in this arising through blind chance are great.

This problem of the origin of the genetic code recently got even more difficult to explain, because scientists recently announced the discovery of a *second* genetic code buried in DNA. Apparently many of the triple sequences have a double-meaning. Explaining one genetic code was a nightmare -- how can we explain two of them?

The improbable existence of the genetic code is a hint of cosmic purpose because the genetic code is like a set of software instructions, a piece of programming; and programming suggests something like a programmer or a designer.

15. Remote Viewing Experiments

Remote viewing is the alleged ability of certain individuals to acquire information about remote locations in some paranormal way. A remote viewer is someone who claims to be able to somehow send his consciousness outward, and find out psychically about distant locations.

To someone unfamiliar with the US government experiments on remote viewing, the idea of remote viewing may seem like pure fantasy. But the fact is that the United States government spent about twenty years researching remote viewing, and spent many millions of dollars investigating the topic, mainly during the 1970's and 1980's. The programs went under a variety of names such as STARGATE. In 1995 the government paid a group called the American Institutes for Research to

evaluate the program. The group issued a report recommending that the research be canceled, and it was.

But many thought there was something very strange about this sudden termination of the program. If the remote viewing programs had not been producing positive results, why were they funded for twenty years? If humans are not capable of remote viewing, it should have taken no more than twenty days to discover that through testing, not twenty years.

In fact, the historical record indicates that the US government experiments on remote viewing did produce positive results time and time again. One remote viewer, Joe McMoneagle, was awarded a Legion of Merit award for his successful remote viewing. A remote viewer working for the US government was apparently able to detect details of a new type of Soviet sub before its existence was known to the US government. There were numerous other remarkable successes, some involving the famous psychic Ingo Swann. In 1977 the CIA director said that it had once worked with a man who could view distant remote places all over the world, probably referring to psychic Patrick H. Price.

What is also interesting is that the very American Institutes for Research report that led to a cancellation of the program contained excerpts indicating that it was actually successful. The URL for the report is below:

http://fas.org/irp/program/collect/air1995.pdf

For example, on page 23 the report states the following (in a section written by University of California statistician Dr. Jessica Uts):

Using the standards applied to any other area of science, it is concluded that psychic functioning has been well established. The statistical results of the studies examined are far beyond what is expected by chance. Arguments that these results could be due to methodological flaws in the experiments are soundly refuted.

Then on page 35 of the report Dr. Uts reviews 154 experiments consisting of over 26,000 trials with 227 subjects. She says, “The statistical results were so overwhelming that results that extreme or more so would occur only about once in every 10^{20} such instances if chance alone is the explanation.” This is a statement that you would have to run the experiments 100,000,000,000,000,000,000 times before you would get by chance a result as significant as the results that were achieved. On page 50 of the report, Dr. Uts concludes the following:

It is clear to this author that anomalous cognition is possible and has been

demonstrated. This conclusion is not based on belief, but rather on commonly accepted scientific criteria.

It was only by some very implausible mental gymnastics and sophistry that other writers in the report were able to argue against the US research on remote viewing. By any reasonable standard, such research was a smashing success, and established overwhelming evidence that remote viewing does actually occur.

The very strong evidence for remote viewing is evidence that is entirely incompatible with the materialist thesis that your consciousness is produced solely by your brain and limited to the confines of your body. Remote viewing seems to involve some kind of projection of human consciousness beyond the body. That such a thing can occur is a strong indicator that something like a human soul or higher spirit exists. As it suggests a higher human reality inexplicable as a product of blind chance, the evidence for remote viewing is a hint of cosmic purpose.

16. Automatic Writing and "Channeled" Books

Automatic writing typically occurs when some person produces writing that he says was not produced by his conscious mind. In a typical case of automatic writing, a person may go into a trance or altered state of consciousness, and then begin to write with a pen. The person may swear that he had no knowledge of what he produced while he was doing this writing. In other cases the person may be in a normal state of consciousness, but may still claim that he is writing something that he did not will his own hand to write. A piece of automatic writing may claim in its own text to be written by someone other than the person who wrote down the words.

There are some interesting cases of text or books produced through automatic writings. William Stanton Moses was a well-respected clergyman who produced automatic writings on religious and philosophical topics, including *Spirit Teachings,* available online. I've briefly looked at the book, which seems to be written at a highly elevated level, showing significant originality of thought (not at all a mirror reflection of the religious orthodoxy of its time).

Geraldine Cummins was said to have produced automatic writing at the very high rate of 2000 words per hour, which is about as fast a person can write. Her automatic writings were often said to contain knowledge she should not have been able to obtain through normal means. Cummins produced automatic writings in a variety of different handwriting and literary styles, often a handwriting or literary style completely different

from her normal writing.

A phenomenon similar to automatic writing is the case of literary works produced by using an Ouija board, a board used by people trying to communicate with deceased people. The most famous example is the case of Pearl Curran, who used an Ouija board to produce some very high-quality literary works. According to Curran (a housewife of limited education), the books were written not by herself but by a 17th century Englishwoman named Patience Worth. The total amount of "channeled" words produced by Curran amounted to four million words, including seven books. In 1917 an anthology of the year's top poems included five "Patience Worth" poems produced by Curran. Patience Worth was at that time a literary sensation.

Quite a few skeptics tried to prove that Curran was a fraud, but none succeeded. According to an article on www.smithsonian.com, "Scholars who examined Patience's work marveled at her deep knowledge of the plants, customs, clothing and cuisine of several historical epochs, stretching back to the ancients, and at her ability to draw on this vast knowledge without hesitation."

A set of cases perhaps even more remarkable than Curran's were a group of cases called the "cross correspondences" cases. F.W.H. Myers was a professor of classical literature who wrote about survival after death. After his death in 1901, various mediums who practiced automatic writing began writing messages that they said were from Myers. Individually the messages seemed cryptic, and the mediums were often baffled by their meaning. The messages included instructions to forward them to the Society for Psychical Research. Scholars at the Society for Psychical Research accumulated the various messages, and found unified themes that were often based on classical literature. A group of the messages would be like pieces of a puzzle that could be assembled to form a coherent whole. Supposedly thousands of these messages were received over a thirty-year time span, some dozens of pages long. Analysts said they could unravel many themes, each expressed by multiple messages to different mediums.

Some regard the "cross-correspondences" cases (involving Myers and others) as the most compelling evidence ever accumulated for life after death. We apparently can't explain the cases as being due to subconscious thoughts from the mediums who claimed to get the messages, or as being due to ESP by such mediums, because the messages involved a level of classical erudition that only a few classical scholars possess, and also because many of the messages only made sense when fragmentary messages from different mediums were fitted together to make a sensible

whole, like pieces of a jigsaw puzzle being fitted together. One of the most compelling cases was the Palm Sunday case, and another compelling case was the Ear of Dionysus case.

Another interesting case was that of Jane Roberts, who said that after using an Ouija board she got messages from a dead person named Frank Withers, who supposedly was part of a "group consciousness" named Seth. Roberts then published an elevated philosophical work called *The Seth Material*, which according to Roberts was produced by this external mind. The book sold many copies.

A rather similar case was the case of James Merrill. Between 1976 and 1980 Merrill produced a three-volume poem called *The Changing Light of Sandover*. The poem won the National Book Critics Circle Award. According to wikipedia.com, Merrill spent twenty years transcribing messages from an Ouija board. His prize-winning 560-page poem was largely based on these "channeled communications."

A more dramatic case is that of Chico Xavier.(1910-2002), who lived in Brazil. Even though barely educated, Xavier produced more than 400 books that sold an estimated 25 million copies. Xavier claimed that the books were being transmitted or dictated to him by spirits of the dead. A fraud, perhaps, who tricked people to enrich himself? No, he gave the royalties from the books to charity. According to the Guardian's obituary, "Several people tried to prove he was a fraud, but no one succeeded." He predicted that he would die on a day of celebration, and died on a day Brazil won the World Cup.

Most of these examples of automatic writing or "channeled" literary works have limited evidential value, because it is often hard to sort out whether the works may have been produced by the subconscious mind or some external spirit. But in regard to the "cross correspondence" cases, no natural explanation seems plausible. So overall these examples do provide some substantial evidence for life after death, and may be counted as another hint of cosmic purpose.

17. The Near Electrical Neutrality of the Universe

As far as we can tell, our universe is close to being electrically neutral. What this means is that the total number of protons in the universe is roughly equal to the total number of electrons in the universe.

Is this what we would expect to occur by chance? No, it isn't. One can think of it in the following way: it is an observed fact of experience that smaller things are more numerous than larger things. Stars are much

smaller than galaxies, and are much more numerous than galaxies. Planets are much smaller than stars, and seem to be more numerous than stars. Rocks are much smaller than planets, and are much more numerous than planets. Cells are more numerous than organisms; molecules are more numerous than cells; atoms are more numerous than molecules; and subatomic particles more numerous than atoms.

So given all of these cases in which the less massive thing is more numerous than the more massive thing, suppose you then tell a person that each proton is 1836 times more massive than each electron. You ask the person: which is more numerous? The person will probably guess that electrons are far more numerous than the protons that are 1836 times more massive.

But as far as we can tell, they aren't. As far as we can see, electrons are about as common in the universe as protons. This is a tremendously convenient state of affairs. It means there can be planets such as ours in which most of the electrons and protons exist within atoms, without too many excess electrons lying around. If there were lots of excess electrons lying around, our planet would be an incredibly dangerous place. Each time you get a nasty static electricity shock from touching a doorknob, it's because of a small excess of electrons on the doorknob. If electrons were much more common than protons, there would be huge numbers of excess electrons hanging around all over the place. You would be constantly shocked with powerful electrical jolts as you walked around. It is doubtful that intelligent life could exist under such circumstances.

A skeptic might say that the universe's near electrical neutrality is just a by-product of a law of nature, the law of the conservation of charge. That may be correct, but it doesn't make the situation seem any less providential. The law of the conservation of charge is a law by which nature always uses a kind of bookkeeping, to insure that the books are balanced in regard to electrical charge. In this sense nature acts like some fastidious bookkeeper who always insists that debit entries are balanced by credit entries. The law of the conservation of charge seems like a highly programmatic law, a law suggestive of some goal that the universe should maintain something close to electrical neutrality. The very existence of such a beneficial law is a hint of cosmic purpose.

18. Child reincarnation memories and birthmarks

When people hear the word reincarnation, they may think of Eastern ideas about people shuffling from one life to another through reincarnation. But there are a variety of possibilities regarding reincarnation. If there is a heavenly afterlife, reincarnation might be an optional choice that some

people choose to avoid monotony or to learn more truths of experience. Or reincarnation might be something mainly for people who didn't "serve their full time" here on our planet, such as people who died early deaths. It could be that only a small fraction experience reincarnation. But is there any evidence that reincarnation actually occurs?

A remarkable case almost a century ago was that of Jagdis Chandra, who at age 3 began talking about a previous life as Jai Gopal in Benares, a city some 300 miles away from the child's home. The child recalled some 51 details, almost half of which were verified before the child met the Gopal family. Upon arriving in Benares, the child recognized several members of the Gopal family, and led them through a maze of streets to the previous home of Jai Gopal.

Another famous case from about the same time was that of Shanti Devi. She claimed to have had a previous life at a place 80 miles away. She made some twenty claims about that life that were verified.

The best evidence for reincarnation was collected by Ian Stevenson, Chair of the Department of Psychiatry at the University of Virginia from 1957 to 1967, and a professor of psychiatry there from 1967 until 2007. Stevenson investigated many cases of young children who reported memories of previous lives. He attempted whenever possible to look for verification of details. For example, if a young child claimed to be the reincarnation of a particular person living in a particular town, Stevenson would attempt to find the family of that person, and to verify any details which the child claimed to remember.

Some of these cases were published in the classic 1966 book *Twenty Cases Suggestive of Reincarnation*. Over 40 years Stevenson investigated over 3000 cases of children who claimed to remember past lives. Stevenson often found that the claims of particular children could be strongly corroborated by doing things such as verifying that someone matching the description had actually lived at the specified place, and verifying the accuracy of claims made by the child about the previous person's life.

Perhaps the most remarkable evidence presented by Stevenson was evidence regarding birthmarks. In the 2268-page two volume opus *Reincarnation and Biology*, Stevenson documented 200 cases of children having both memories of past lives and also birthmarks which matched the claimed memories of a past life. In very many cases the details of the previous life were verified, along with details of the death of the person, including details that matched the birthmark. Stevenson stated this: "In 43 of 49 cases in which a medical document (usually a postmortem report) was obtained, it confirmed the

correspondence between wounds and birthmarks (or birth defects)."

Stevenson's type of research has been continued by Jim Tucker, an associate professor of psychiatry at the University of Virginia. Tucker has investigated and documented quite a few cases of American children who claimed to have led past lives, cases in which the details of the previous life can apparently be corroborated. Tucker has compiled a database of some 2500 cases of reincarnation memories. He offers this interesting observation: "In 70% of the cases the previous person died by unnatural means, meaning murder, suicide, or accident." Some of the cases Tucker has examined are profiled in the television series *The Ghost Inside My Child*, which features interviews with the parents of children claiming memories of past lives.

Such evidence for reincarnation is a hint of cosmic purpose. Eastern religions have sometimes depicted reincarnation as some kind of blind, automatic, inevitable process, but such an idea makes little sense (and is also inconsistent with Tucker's data that the reincarnation memories are usually associated with special types of death). Reincarnation is not something we would expect to see in a universe ruled by blind chance. In such a universe, when you die, you die. Reincarnation is something that might sometimes occur (for one of several reasons, possibly only voluntarily) as part of an overall cosmic plan in which spiritual growth or diversity of experience are crucial components.

19. The prevalence of the number 3 in nature's blueprint

Looking at the fundamental physical features of the universe, we find that the number 3 seems to occur an unusually high number of times.

First of all, there are **three** main types of stable particles: the proton, the neutron, and the electron. These are the **three** building blocks of atoms. All solid matter consists of atoms built entirely from these **three** particles.
.
Scientists say that each proton and each neutron is built from smaller particles called quarks. How many quarks are there in a proton? Exactly **three**. How many quarks are there in a neutron? Exactly **three**.

Scientists also say that are **three** "generations" of quarks. The second and third generations (consisting of the top, bottom, strange, and charm quarks) quickly decay into the first generation consisting of the up quark and the down quark (the two types of quarks found in protons and neutrons).

There are also **three** “generations” of leptons. The tau and muon generations are very short-lived, leaving the electron as the only stable lepton with significant mass (the neutrinos have virtually no mass).

We also have **three** types of massive bosons as part of the standard model of physics: the Higgs boson, the W boson, and the Z boson. There are also **three** types of neutrinos.

On the subatomic level there are **three** types of charges: positive charges like protons have, negative charges like electrons have, and neutral charges like neutrons have.

Subatomic particles also have an important property called spin. The leptons and quarks all have a lowest spin of ½. The four gauge bosons have a lowest spin of 1. The Higgs boson has a spin of 0. This means there are **three** different minimum values of spin that particles can have.

There are **three** main properties associated with subatomic particles: mass, charge, and spin. Except for the “ghostly” neutrino particles and the energy particles called photons and gluons, each type of particle has a unique combination of mass, charge, and spin.

There are **three** fundamental subatomic forces: the strong nuclear force that holds an atomic nucleus together, the electromagnetic force that keeps electrons in the atom, and the weak nuclear force that sometimes causes an atomic nucleus to eject a particle. The other fundamental force, gravity, has no effect on the subatomic level. Physicists say that there are **three** types of "color charge” involved in the strong nuclear force: what are called red charges, blue charges, and green charges.

Looking at the visible world, there are **three** dimensions of space: height, width, and depth. There are **three** main types of matter: gaseous, liquid, and solid. There are **three** main types of massive objects: planets, stars, and galaxies.

There are also **three** main types of galaxies: spiral galaxies, irregular galaxies, and elliptical galaxies. Almost all types of galaxies are one of these **three** types (with other types such as ring galaxies being very rare).

Besides the **thre**e laws of motion, there are also **three** types of natural laws: the laws of physics, the laws of chemistry, and the laws of biology.

As if this wasn't abundant proof enough that nature seems to like the number three, we have the unexplained fact that the ratio between the electric charge of the electron and the electric charge of the down quark

(one of the two types of quarks that make up the proton) is precisely 3.0000 (**three)**.

So we find the number three a remarkable number of times in nature's fundamental design. Such a fact is a hint of cosmic purpose, because it suggests that the universe has been designed according to some simple physical plan.

20. Physical mediumship

Physical mediumship is when a psychic produces some remarkable physical phenomena that is alleged to derive from contact with some spirit world or spirit dimension. The nineteenth century was the high-water mark of physical mediumship.

The greatest physical medium ever was Daniel Dunglas Home, a medium with an astonishing success record. According to accounts, Home held seances that produced an astonishing range of paranormal phenomena under well lighted conditions, often while being observed by the cream of the European social set, including people such as Queen Sophia and Napoleon III. The seances were held in the homes of hundreds of other people. Astonishingly, many witnesses claim they saw Home levitating. In one famous incident three distinguished Englishman (a Lord, a future Earl, and a sea captain) claimed that they had seen Home levitating out one open window 70 feet above the ground, and then levitating back into another window.

Home apparently was never discovered to be engaging in any fraud or trickery, leaving skeptics groping for possible explanations. Some contemporary magicians claimed that they could reproduce the phenomena produced by Home, but none were able to produce even half of the astonishing things witnesses claimed went on during his seances and exhibitions.

Home was investigated at length by the eminent scientist Sir William Crookes, the discover of the element thallium, and a man who helped to pave the way for the cathode ray tube and the X-ray machine. Crookes said he could detect no trickery and no sign of dishonesty on Home's part. Crookes also said he saw at least six times Home producing a phenomenon of a musical instrument playing without human hands. According to Crookes, Home produced this phenomenon with a new accordion Crookes had purchased, and even after Crookes arranged for a special cage to prevent any trickery.

Another famous physical medium was Eusapia Palladino. Earthy, vulgar,

poorly educated, and of low social status, Palladino was known to sometimes use clumsy, easily detectable cheats to fool people watching her (she claimed that she sometimes did this to test the vigilance of her investigators). Such a fact might make it easy to dismiss her activities, were it not for the fact that numerous distinguished witnesses and scientists claim to have seen her perform a rich variety of astonishing paranormal phenomena under well-lighted conditions in which fraud or magic would presumably be impossible. An example is reported on page 200 of the book *Ghost Hunters* by Deborah Blum. The account given by Blum is that Frederic Myers (a leading scholar of the era) and Oliver Lodge (a world-class scientist) placed themselves shoulder to shoulder with Palladino, firmly grasping both of her hands. Another man then grasped Palladino's feet. Despite this restriction, according to the account, Palladino was able to achieve a levitation of a heavy table four feet away, which turned itself upside down. Many similar amazing accounts were written up of Palladino's activities under controlled conditions, with numerous distinguished witnesses stating they had seen seemingly impossible things happen under conditions that ruled out the possibility of magic.

The URL below can be used to read Harrington Carrington's book on scientific investigations into Palladino.

https://archive.org/details/eusapiapalladino1909carr

In a very lame attempt to discredit Carrington's book, the wikipedia.org article on Palladino suggests (without any evidence) that Carrington might have been having an affair with Palladino. Hardly a plausible idea, since the handsome Carrington was 26 years younger than the very plain-looking Palladino. The ever-skeptical wikipedia also has no real explanation for the time when skeptical magician Howard Thurston came to debunk Palladino. Arriving at a hotel room, he thoroughly examined the room and a table in it, finding nothing suspicious. Palladino then (according to Thurston) levitated the table well above the ground. Thurston crawled under the table looking for some trick, but found nothing. The skeptic was convinced it was a real paranormal force being displayed.

More recently Rudi Schneider (1908-1957) was a physical medium who was able to pass very sophisticated scientific tests. The “spirit control” of Schneider was able to move objects, even under controlled scientific conditions that should have prevented any fraud.

In May 1924 the Journal of the American Society for Psychical Research published a paper called “Stella C.” by Harry Price, one of the leading

psychical investigators of his day. The paper documented in great detail the experiments Price had carried out in 1923 with a medium named Stella Cranshaw (someone who Price had discovered while she was working as a nurse). According to Price, he and more than a dozen other observers (who he listed) had observed astonishing physical phenomena at a series of well-lighted seances with Cranshaw. The phenomena included indoor sudden temperature drops of up to 20 degrees, objects in sealed and locked chambers moved around, and heavy tables being levitated (in addition to being inexplicably turned upside-down). According to Price, Cranshaw predicted with great accuracy a newspaper front page 37 days before it was published.

A fairly recent example of physical mediumship was the long series of seances known as the Scole experiments, discussed later in this book.

Because physical mediumship typically takes place at seances in which mediums attempt to contact the dead, the dramatic phenomena witnessed at such seances provides evidence for life after death, evidence which tends to bolster the idea of cosmic purpose.

21. The Existence of Self-Conscious Beings With Inner Lives

One of the great problems of philosophy and science is the problem of the origin of consciousness. The problem lies in the fact that matter and Mind seem like two entirely different things. Matter is material, and consciousness is immaterial. How can a material thing give rise to an immaterial thing? It doesn't seem strange that an immaterial thing (your mind) could give rise to another immaterial thing (a thought). It doesn't seem strange that a material thing (for example, our planet) could give rise to another material thing (for example, a volcano). But it does seem strange that an immaterial thing (matter) should be able to give rise to an immaterial thing (consciousness). This problem has been called “the hard problem of consciousness” by philosopher David Chalmers, and philosophers have filled up volumes debating it.

To a person such as me who has spent lots of time developing software, the problem of the origin of consciousness seems all the more vexing. This is because I understand well a point that many overlook: the observation that thinking and information processing are not at all the same as self-consciousness, and that therefore we can't even explain self-consciousness from a Darwinian standpoint.

Let me explain this point. The term “intelligence” is sometimes used as a blanket term to cover anything that processes information successfully. But intelligence does not necessarily mean consciousness or self-

consciousness. You can have something that is intelligent in the sense of being able to process information and solve problems, but such a thing might be totally lacking in self-consciousness, without any inner life. A good example is a computer program.

A good, sophisticated computer program has some degree of intelligence, in the sense of being able to process information and solve problems. But a computer program is totally lacking in self-consciousness. Computer programs have not one speck of an inner life like we humans have. Even a mighty computer program that runs on a supercomputer has not bit of real consciousness like we humans have. The program may be able to access stored data, but that is not the same as consciousness.

Now let us consider the evolution of large life-forms on our planet. It is entirely possible that large life-forms could have arisen without the slightest trace of real consciousness, without any inner lives at all. Such organisms would have acted like robots or computer programs. They might have made observations and processed information, but without having any self-consciousness or inner lives. Philosophers sometimes use the term "philosophical zombies" to refer to such a a possibility.

How, then, can we explain self-consciousness and inner lives from some standpoint of Darwinian natural selection? We cannot. From an evolutionary standpoint, there is no need for self-consciousness. A mammal without any self-consciousness and without any inner life could survive just as well. It would simply process information and crunch visual information as a computer program does, without having any more any self-conscious inner life than a computer program has. This is not to imply that there is anything wrong with the thesis of Darwinian natural selection, but merely to point out one of its explanatory limits (evolution is certainly good at explaining quite a few other things).

It is also very difficult to explain human self-consciousness through any theory of neurology.
We currently have no idea as to how the brain produces self-consciousness, the bluster of some neurologists notwithstanding. Will technology bridge this gap? Imagine if brain scientists were to build bigger and better brain scanners, allowing them to see the activity of the brain at higher and higher magnifications. It is hard to imagine that one day a person using such a scanner would say, "Aha, t*here* is a thought being produced" or "I see it-- *there* is an idea arising from a neuron." What possible observations could ever lessen the mystery of how matter could produce Mind?

But somehow man acquired self-consciousness. Some philosophers have

been so vexed by the problem of how Mind could have arisen from mere matter that they adopted a position known as idealism. Idealism is the position that matter does not really exist, that only Mind exists, and that all matter exists merely as perceptions or ideas within minds. I do not currently advocate such a position (although I think it's an interesting possibility that is hard to rule out). But I do think that the very existence of self-consciousness is another hint of cosmic purpose. Not being explainable purely through Darwinian evolution, self-consciousness is not at all something we would expect to find in a random universe ruled by blind chance. But it is something that we would absolutely expect to exist in a universe designed for particular purposes.

22. The Amazing Roundness of the Electron

Electrons are one of the three types of particles that make up an atom. Scientists at the Imperial College in London have done experiments to determine how round the electron is. Their results are astonishing. Their web site says: “So far we've checked the roundness of the electron to an incredible degree of precision: the equivalent would be measuring the diameter of the solar system to better than the width of one human hair. And so far, we've seen no evidence of non-roundness.”

Scientific American summarizes these results by saying : “The electron is a perfect sphere, give or take barely one part in a million billion.”

The Guardian summarizes these results as follows: “In the most exquisite measurements yet, researchers declared the particle to be a perfect sphere to within one billionth of a billionth of a billionth of a centimeter. Were the electron scaled up to the size of the solar system, any deviation from its roundness would be smaller than the width of a human hair, the team said.”

To get a feel for how remarkable this is, let's compare this degree of roundness to the degree of roundness of the roundest thing humans have ever manufactured. In 2008 New Scientist ran a story entitled “Roundest Objects in the World Created.” It told the story of how some super-round spheres were created by a scientific team that included an optical engineer named Achim Leistner, using a slow, careful process that took months. Leistner said, “"If you were to blow up our spheres to the size of the Earth, you would see a small ripple in the smoothness of about 12 to 15 mm, and a variation of only 3 to 5 metres in the roundness."

Now the solar system has a diameter about 10,000 times larger than the diameter of the Earth, and a human hair is about one ten thousandth (1 in 10,000) the size of 3 to 5 meters. So the previously mentioned degree of

roundness in the electron is actually 100 million times greater than the degree of roundness in Leisnter's spheres (supposedly the roundest ever manufactured).

Think of it: each of the the electrons all around us is at least 100 million times rounder than the roundest thing man ever manufactured, when scientists were deliberately trying to make something as round as possible.

The eerie super-roundness of the electron is a hint of cosmic purpose because it causes us to think of electrons as if they were components manufactured by some incredibly precise and fastidious manufacturer. In a random, purposeless universe we might expect that electrons would have random variations in size and shape, not they would all be perfectly round to 1 part in 1,000,000,000,000,000.

23. Past Life Regressions and Xenoglossalia

When people hear the word reincarnation, they may think of Eastern ideas about people shuffling from one life to another through reincarnation. But there are a variety of possibilities regarding reincarnation. If there is a heavenly afterlife, reincarnation might be an optional choice that some people choose to avoid monotony or to learn more truths of experience. Or reincarnation might be something mainly for people who didn't “serve their full time” here on our planet, such as people who died early deaths. It could be that only a small fraction experience reincarnation. But is there any evidence that reincarnation actually occurs?

One such line of evidence was the childhood memories of previous lives discussed earlier, which were compiled over the course of decades by Stevenson. Another line of evidence is accounts of past lives given by adults put under hypnosis. When put under hypnosis, adults often give accounts of living a previous life as a previous person.

We are not sure where such accounts come from. They could come entirely from the human imagination or the human subconscious. An attempt to study the matter scientifically was made by Dr. Helen Wambach, who conducted a 10-year survey of more than 1000 people giving past life accounts under hypnosis. Wambach found that 50.6% of the accounts were of male lives, and 49.4% were of female lives, which matches the ratio in the human population. Wambach also classified the accounts according to whether people described a lower-class life, a middle-class life, or an upper-class life. She found that the proportions in the accounts matched our historical understanding of the class distributions during particular historical eras. Wambach also found that almost all of the accounts were compatible with historical records. There

were a few people who had errors such as a person saying he played the piano in the 15th century, before the piano was invented. But such inaccuracies were very uncommon.

In 1983 Australian psychologist Peter Ramster made a documentary entitled "The Reincarnation Experiments," which can be viewed online on sites such as the one below.

http://www.victorzammit.com/evidence/pastliferegressions.htm

The documentary took camera crews to investigate sites out of Australia that were described in past-life regressions by four Australians. The descriptions turned out to be extremely accurate, with all kinds of exact matches that the Australians shouldn't have been able to know about. In this documentary and in other televised past-life regressions, a subject will sometimes speak in a language unknown to him or her. For example, an American who does not know French may recall under hypnosis a past life as a Frenchman, and may start speaking in French. This type of use of a language that should be unknown to the speaker is called xenoglossalia.

Past lives recollections may be evidence that reincarnation actually occurs. An alternate hypothesis is that during the hypnotic state, the human mind can act as a kind of medium, channel or receiver, and that the information about past lives comes from some external source, possibly other people who have died. In either case, such evidence is a hint of cosmic purpose. In a purposeless universe ruled by chance, we would expect there to exist no evidence for reincarnation.

24. The Existence and Persistence of Spiral Galaxies

The universe consists of billions of galaxies, and each galaxy is a group of millions or billions of stars. There are three main types of galaxies: elliptical galaxies that are shaped like spheres or footballs, irregular galaxies that are kind of blob shapes, and spiral galaxies. Spiral galaxies have a beautiful and distinctive spiral shape. We live in such a spiral galaxy, one called the Milky Way. Some spiral galaxies have such a beautiful shape that they are known as "grand design" galaxies.

Spiral galaxies are not anything that should be taken for granted. These awesome and very beautiful objects (among the most beautiful things in existence) have a long list of special requirements that must be met in order for them to exist.

Scientists speculate that galaxies formed by gravitational attraction from primordial density fluctuations. This idea is really just guesswork, but

even if it is true, such a process would have required a great deal of luck. The density fluctuations would have needed to be the right size, or galaxies would not have formed. Also, there would have to be a lucky balance between the universe's expansion rate after the Big Bang and the strength of gravitation. If the expansion rate had been a tiny bit faster, the universe would have expanded too quickly for galaxies to form. If the expansion rate had been a tiny bit slower, density fluctuations would not have formed into habitable galaxies, but would instead have formed into black holes. We can also restate the previous two sentences, substituting "gravitation" for "expansion rate." It seems that for any one expansion rate of an expanding universe, there is one strength level for gravitation consistent with the formation of spiral galaxies; and for any one strength level for gravitation, there is one expansion rate consistent with the formation of spiral galaxies. The two numbers have to match by a providential kind of "lucky coincidence."

Besides these requirements, there are others. Scientists believe that something called dark matter plays a crucial role in the formation and persistence of spiral galaxies. The properties and abundance of dark matter (currently unknown to us) must be right for spiral galaxies to form and persist. Then there is still another thing that must be fine-tuned for spiral galaxies to form and persist: another mysterious thing called dark energy. In short, five different factors must all go right for you to end up with spiral galaxies that still persist 13 billion years after the universe's expansion began: the primordial density fluctuations, the universe's expansion rate, the strength level of gravitation, dark matter, and dark energy.

One cosmologist has noted highly unusual characteristics of dark matter that plays a role in cosmic structure formation:

"The dark matter seems to 'know' how the visible matter is distributed. They seem to conspire with each other such that the gravity of the visible matter at the characteristic radius of the dark halo is always the same...It's like finding a zoo of animals of all ages and sizes miraculously having identical, say, weight in their backbones or something...It is possible that a non-gravitational fifth force is ruling the dark matter with an invisible hand, leaving the same fingerprints on all galaxies, irrespective of their ages, shapes and sizes."

We know that a big galaxy like ours takes about 250 million years to rotate. This fact leads to a problem called the winding problem. A straightforward analysis of galactic rotation suggests that after two or three rotations, the spiral arms of spiral galaxies should "wind up," causing the spiral galaxy to lose its spiral shape. But since the universe is 13 billion

years old, galaxies such as ours should have rotated at least 40 times. So how is it that we can still have spiral galaxies throughout the universe? Apparently some other poorly understood "lucky" physics must be at work to allow spiral galaxies to persist for billions of years.

All of these factors combine to create the idea that we are extraordinarily lucky to have spiral galaxies in our universe. Given all the requirements, it is doubtful that one out of a million random universes would be expected to have spiral galaxies that continue to exist in abundant numbers for more than 10 billion years. The existence and persistence of spiral galaxies is therefore a hint of cosmic purpose, something that suggests the universe was designed by some entity interested in seeing that spiral galaxies would exist in abundance.

25. The Fine Tuning of Parameters Relevant to Stable Sun-like Stars

The sun is perhaps the perfect example of a marvelous thing that every one takes for granted. The average person has no appreciation or admiration for the existence of a nearby star that burns at a slow steady rate for billions of years; he just takes it as a given. But as physicists have studied the physics needed to have stars like the sun, they have come to appreciate what a marvelous balancing act is going on in the sun.

You might get some appreciation for the sun when you consider what a balancing act is going on inside it. As the gravity of every body is proportional to its mass, the sun has a very high gravity many times greater than our planet's gravity. If this force were not balanced by another force, it would cause the sun to collapse in on itself. But this inward force of gravity is balanced by another outward force caused by the sun's release of energy because of thermonuclear fusion. This delicate balancing act has been going on for billions of years. You might get some appreciation for this if you consider that the sun is like a nuclear bomb that is exploding not in one big bang but in a slow-motion kind of way, so that rather than the bomb going off all at once, it's like a nuclear explosion that is taking billions of years. In this sense, the sun bears a significant resemblance to a well-designed nuclear reactor.

Few would suggest that the sun was deliberately designed, but the idea of design may come to mind when you consider the delicately balanced physics that the sun depends on. It turns out that the physics of the universe have to be just right for stars like the sun to exist. In his book *The Accidental Universe*, physicist Paul Davies says (page 73), "If gravity were *very* slightly weaker, or electromagnetism *very* slightly stronger (or

the electron slightly less massive relative to the proton), all stars would be red dwarfs. A correspondingly tiny change the other way, and they would all be blue giants." Blue giants are too-short lived for life to evolve near them, and red dwarf stars are not believed to be as favorable for life's evolution as sun-like stars (red dwarf stars have smaller habitable zones, and such zones get bombarded with significant radiation).

It seems that at least a million-to-one shot was required in order for the universe to have stars like our sun, the type of stars that are best-suited to support planets on which intelligent life evolves. This is another case of nature landing its arrow right in the middle of the distant bullseye target, another case of the universe landing the golf ball in the golf ball hole, another case of nature winning the cosmic sweepstakes. The next time you look at the sun, remember that the very existence of stars like that is a hint of cosmic purpose.

26. Spirit Photographs and Apparition Videos

Spirit photographs are photographs allegedly showing evidence of some apparition or spirit. People have been claiming to have photographic evidence of apparitions or spirits almost as long as photography has existed. In the 1860's William Mumler took many photographs that seemed to show faces that were not visible to the original photographer. Mumler was later charged with fraud, but the charges were dropped. There is disagreement over whether any of Mumler's "spirit photographs" were authentic. A few decades later Edward Wyllie achieved a reputation as a spirit photographer, and was supposedly able to repeatedly take photographs of people which showed their dead relatives in the backgrounds of the photos, even when photographing strangers.

Over the decades quite a few photographers have claimed to take photographs showing some spirit or apparition. Nowadays new examples of such photographs seem to appear about 10 to 30 times per year on the Internet. After reporting a story of a ghost photograph taken by a friend of hers, a writer on the www.theatlantic.com web site recently reported the following:

Then a few weeks later I discovered an image of a man in the background of a photo I took with my own iPhone. The picture was taken in my apartment and the man, whom I can't identify, was not actually in the apartment at the time.

Skeptics would argue that it is easy to fake digital spirit photographs, using software such as Photoshop. But there have been many famous spirit photographs taken with non-digital cameras, photographs taken before

1980. In many cases the original negatives have been examined, with no evidence of fraud detected. (I will remind young readers that negatives are pieces of film which are directly exposed to light, without any electronics being involved. Digital Photoshop-type manipulation is impossible on a negative, or at least was impossible prior to 1980.)

One of the most famous alleged spirit photographs was the "Brown Lady" photograph taken in Raynham Hall in Norfolk, England. A professional photographer and her assistant were taking photographs for a magazine, when the assistant claimed to see an apparition on some stairs. The photographer took a picture, which showed a ghostly form on the stairs.

Another famous alleged spirit photograph was the "Greenwich Ghost" picture showing a ghostly form on a stairway. The original photo and its negative were examined by Kodak, which found no evidence of fraud.

Quite a few similar photographs have seemed to show apparitions. In a similar vein, there are quite a few photographs showing apparitions alleged to have materialized during a séance, such as the Katie King photographs taken during the investigation of Florence Cook by scientist Sir William Crookes.

More recently, the growth of videotaping for security purposes has led to a plethora of "ghost videos." You can see hundreds of them by searching for "ghost video" on www.youtube.com.
In some cases, these videos seems to show inexplicable cases of inanimate objects moving about. In other cases, the videos seem to show luminous blobs or dark shadows moving about.
Numerous long-running television programs such as *Ghost Adventures* claim to produce evidence of ghosts.

Nowadays it is easy to fake a ghost photograph, but not very easy to fake a realistic-looking ghost video. It's always possible that there is some large group of fraud artists grinding out fake spirit videos and posting them to the Internet, but such an idea seems rather hard to swallow because of a lack of a clear motive for such expensive undertakings. One would think that if such a thing were happening there would be more evidence of such fraud. I did a Google search for the phrase "admits ghost video was fake," and after searching through several pages of results, I found not one single case of a person who admitted faking such a video. A Google search for the exact phrase "faked a ghost video" produces zero results. A search for "fake a ghost video" produces three pages of results, but none in which anyone confesses to having faked such a video.

Although the possibility of "fraud, fraud, and nothing but fraud" prevents

us from regarding spirit photography and ghost videos as firm evidence of cosmic purpose, we can at least regard such photographic evidence as being a hint of a purposeful universe in which life after death occurs.

27. Reports of After-Death Communications

After-death communications (ADC) is a phenomena in which people report unusual activity which they interpret as being a sign from a deceased relative. These alleged contacts take place during regular living activities, not in some special session such as a seance. A 1987 poll conducted by Andrew Greeley for the National Opinion Research Center found that 42% of American adults believe they have been in contact with someone who has died, and 67% of widows believe they have been in contact with someone who has died.

Bill Guggenheim and Judy Guggenheim in 1988 created something called The ADC Project to document such cases. They collected more than 3000 accounts from people who claim to have been contacted by a deceased loved one, interviewing more than 2000 of them. They published their results in a book entitled *Hello From Heaven*.

Supposedly there are various different types of after-death communications. In some cases people will have vivid dreams of a departed loved one, perhaps a dream imparting some special message. In other cases people say they briefly hear the voice of a dead relative, perhaps to give a warning or provide advice. Many people say that they see apparitions of departed relatives, either as a full-sized body or just as a face.

In other cases, people say they feel a touch that seems to come out of nowhere. In other cases, people feel a strong intangible sense of a departed person's presence. Other people say that they may suddenly smell a fragrance or odor that they associate with a departed love one, such as a distinctive perfume or the odor of a cigar smelling like a cigar the person smoked. In many cases, people claim to find small objects around the house in places they shouldn't be, objects such as coins or feathers.

Many hundreds of these accounts of alleged after-death communication can be found on the web site below:

http://www.adcrf.org/

Let me share some of my experiences that may well be examples of after-death communication. About nine days after my stepmother died, I was in my kitchen putting something in the refrigerator when a pan I kept on top

of the refrigerator inexplicably fell to the floor. About eight seconds later (while I was staring quizzically at the top of the refrigerator), a cutting board I kept in a groove behind my sink faucets inexplicably fell to the floor. The two items mysteriously fell to the floor on opposite ends of my kitchen, within 8 seconds of each other. I later did tests to see whether there was any way that the cutting board could have fallen to the floor from the position it was in. The tests seemed to indicate the board couldn't possibly have fallen naturally to the floor, because of faucets blocking it. Basically it was just as if my recently departed stepmother was sending signs out, knocking a few things around as if to say, “I'm still here.”

One summer when I was alone in my apartment (with my wife and children on vacation elsewhere) I tried an experiment in which I tried to reach out mentally to the spirit of my late mother. I put a picture of her in a frame. Then I held the picture, and thought about pleasant memories of her. I visualized my mind kind of sending out radio waves trying to contact my mother.

Shortly thereafter I noticed pennies seeming to appear in unusual places around the apartment, in places they shouldn't have been. I did a google search of the term “pennies from heaven paranormal” and found many cases of people who claimed to have found pennies that they interpreted as being signs from a departed love one.

I said to myself, “Let me test this hypothesis.” So I went around the apartment carefully cleaning up all coins that were outside of coin jars. I double-checked that there were no coins anywhere except in coin jars. Then I placed some stacks of pennies next to the picture of my mother. I had a thought along the lines of: “If you want to send me some pennies, you can use these.”

I then immediately went into my kitchen to pour some lemon juice into a cup of tea I had prepared. As I was pouring the juice, I suddenly saw to my right a penny rolling along the floor. The penny was rolling on its edge. I was dumbfounded. I had no explanation as to how this penny could have appeared with that particular rolling motion. Given the perpendicular relation of the penny's motion and my position, it couldn't possibly have been a penny on the floor that I had kicked (plus I had just double-checked that there were no coins on any of my floors or counters).

Over the next two months there seemed to be quite a few other seemingly inexplicable appearances of coins in my apartment. During one 2-day period I found 9 “coins that shouldn't be there,” all of them heads up. On another occasion I found some white feathers on my carpet. White feathers are also often reported as signs from a departed love one. Could the

feathers have drifted in through my windows? No, the windows were screened.

I will mention one other case from my own experience. One day I was on a walk thinking of my departed mother, and how I wished I had thanked her more for all she had done. I had just read on the internet about people who talked about finding white feathers that they interpreted as signs from the dead or signs from an angel. While walking I thought to myself: it would be nice to find a white feather on my doorstep, which would be a really impressive sign. When my walk was almost done, I suddenly saw a white feather floating down in the air, only a few feet ahead of me. There were no birds or trees nearby.

If this was a coincidence, the odds against it were astronomical. Of course, it is possible that as I was walking a bird silently flew overhead and shed a white feather at just the right time (not the typical color of bird feathers in my area), and that the feather just happened to float just in front of my walking path, on the same walk on which I was thinking about getting a white feather as a sign from the dead. But the chance of that happening seems like the chance of me winning a huge lottery jackpot tomorrow. This was the only time in my life in which I can ever recall seeing a white feather float down in front of me as I walked.

Apparently many people have had similar experiences, with coins and white feathers being among the most commonly reported signs. A writer in 2006 produced a blog post about finding dimes whose appearance he could not explain. His post has got 161 comments, most from other people who had similar experiences. Many of these interpreted the dimes as signs from the great beyond.

Because such incidents are a hint that there is a life after death, they are a hint of cosmic purpose.

28. The Law of the Five Allowed Stable Particles and the Subatomic Conservation Laws

Let us take a very close look at some important laws of nature. When you go to the trouble of looking very closely at these laws, you may end up being stunned by their seemingly programmatic aspects, and you may end up getting some insight into just how apparently methodical and conceptual the laws of nature are.

The laws I refer to are some laws that are followed when subatomic

particles collide at high speed. In recent years scientists at the Large Hadron Collider and other particle accelerators have been busy smashing together particles at very high speeds. The Large Hadron Collider is the world's largest particle accelerator, and consists of a huge underground ring some 17 miles wide.

The Large Hadron Collider accelerates protons (tiny subatomic particles) to near the speed of light. The scientists accelerate two globs of protons to a speed of more than 100,000 miles per second, one glob going in one direction in the huge ring, and another glob going in the other direction. The scientists then get some of these protons to smash into each other.

Such a high-speed collision of protons or nuclei can produce more than 100 “daughter particles” that result from the collision. The daughter particles are rather like the pieces of glass you might get if you and your friend hurled two glass balls at each other, and the balls collided (please don't ever try this).

The results of a collision like that may seem like a random mess, but nature actually follows quite a few laws when such collisions occur. The first law I will discuss is one that there is no name for, even though there should be. This is the law we might call the Law of the Five Allowed Stable Particles. This is simply the law that the stable long-lived output particles created from any very high-speed subatomic particle collision are always particles on the following short list:

Particle	Rest Mass	Electric Charge
Proton	1.67262177×10^{-27} kg	$1.602176565\times10^{-19}$ Coulomb
Neutron	$1.674927351\times10^{-27}$ kg	0
Electron	9.10938291×10^{-27} kg	$-1.602176565\times10^{-19}$ Coulomb
Photon	0	0
Neutrino	Many times smaller than electron mass	0

I am not mentioning antiparticles on this list, because such particles are destroyed as soon as they as come in contact with regular particles, so they end up having a lifetime of less than a few seconds.

This Law of the Five Allowed Stable Particles is not at all a trivial law, and raises the serious question: how is it that nature favors only these five particles? Why is it that high-speed subatomic particle collisions don't produce stable particles with thousands of different random masses and thousands of different random electric charges? It is as if nature has inherent within it the idea of a proton, the idea of an electron, the idea of a neutron, the idea of a photon, and the idea of a neutrino.

When particles collide at high speeds, nature also follows what are called conservation laws. Below is a list of some conservation laws that are followed in high-speed subatomic particle collisions. Particles with positive charge are shown in blue; particles with negative charge are shown in red; and unstable particles are *italicized* (practically speaking, antiparticles are unstable because they quickly combine with regular particles and are converted to energy, so I'll count those as unstable particles). The particles listed before the → symbol are the inputs of the collision, and the particles after the → symbol are the outputs of the collision. The → symbol basically means "the collision creates this."

Law: law of the conservation of charge
Description: The ratio between the proton-like charges (called "positive" and shown here in blue) and the electron-like charges (called "negative" and shown here in red) in the outputs of a particle collision must be the

same as the ratio was in the inputs of the collision.
Example of particle collision or decay allowed under law: proton + proton →proton+neutron + *positron* +electron neutrino (two proton-like charges in input, two proton-like charges in output)
Example of particle collision or decay prohibited under law: **proton + proton →proton+neutron +electron+electron neutrino (t**wo proton-like charges in input, only one proton-like charge in output)

Law: law of the conservation of baryon number
Description: Using the term "total baryon number" to mean the total of the protons and neutrons (minus the total of the *antiprotons* and *antineutrons*), the total baryon number of the stable outputs of a particle collision must be the same as this total was in the inputs of the collision
Example of particle collision or decay allowed under law:proton + proton →proton +neutron + *positron*+electron neutrino (total baryon number of 2 in inputs, total baryon number of 2 in the outputs)
Example of particle collision or decay prohibited under law: proton + neutron →proton+*muon* + *antimuon* (total baryon number of 2 in inputs, total baryon number of 1 in the outputs)

Law: law of the conservation of lepton number (electron number "flavor," there also being "flavors" of the law for muons and tau particles)
Description: Considering electrons and electron neutrinos to have an electron number of 1, and considering a *positron* and anti-neutrinos (including the *anti-electron neutrino*) to have an electron number of -1, the sum of the electron numbers in the outputs of a particle collision must be the same as this sum was in the inputs of the collision
Example of particle collision or decay allowed under law:
neutron→proton +electron+*anti-electron neutrino* (total electron number of inputs is 0, net electron number of outputs is 0)
Example of particle collision or decay prohibited under law:
neutron→proton +electron (total electron number of inputs is 0, but net electron number of outputs is 1)

Each of the examples given here of allowed particle collisions is only one of the many possible outputs that might be influenced by the laws above. When you have very high-energy particles colliding, many output particles can result (and nature's burden in following all these laws becomes higher).

Now let us consider a very interesting question: does nature require something special to fulfill these laws – perhaps something like ideas or computation or figure-juggling or rule retrieval? In the case of the law of the conservation of charge, it does indeed seem that nature requires "something extra" along these lines.

First, it must be stated that what is called the law of the conservation of charge has a very poor name, very apt to give you the wrong idea. It is not at all a law that prohibits creating additional electric charges. In fact, when two protons collide together at very high speeds at the Large Hadron Collider, we can see more than 70 charged particles arise from a collision of only two charged particles (two protons). So it is very misleading to state the law of the conservation of charge as a law that charge cannot be created or destroyed. The law should be called the law of the conservation of *net* charge. The correct way to state the law is as I have stated it above: the ratio between the proton-like charges (in other words, positive charges) and the electron-like charges (in other words, negative charges) in the outputs of a particle collision must be the same as the ratio was in the inputs of the collision.

This law, then, cannot work by a simple basis of “something can't be created out of nothing.” It requires something much more: apparently that nature have something like a concept of the net charge of the colliding particles, and also that it somehow be able to figure out a set of output particles that will have the same net charge. The difficulty of this trick becomes apparent when you consider that the same balancing act must be done when particles collide at very high speeds, in a collision where there might be more than 70 charged output particles.

I may also note that for nature to enforce the law of the conservation of charge (more properly called the law of the conservation of net charge), it would seem to be a requirement that nature somehow in some sense “know” or have the idea of an abstract concept – the very concept of the net charge of colliding particles. The “net charge" is something like “height/weight ratio” or “body mass index,” an abstract concept that does not directly correspond to a property of any one object. So we can wonder: how is it that blind nature could have a universal law related to such an abstraction?

In the case of the law of the conservation of baryon number, we also have a law that seems to require something extra from nature. It requires apparently that nature have some concept of the total baryon number of the colliding particles, and also that it somehow be able to figure out a set of output particles that will have the same total baryon number. Again we have a case where nature seems to know an abstract idea (the idea of total baryon number). But here the idea is even more abstract than in the previous case, as it involves the quite abstract notion of the total of the protons and neutrons (minus the total of the antiprotons and antineutrons). This idea is far beyond merely a physical property of some particular particle, so one might be rather aghast that nature seems to in some sense

understand this idea and enforce a universal law centered around it.

The same type of comments can be made about the law of the conservation of lepton number. Here we have a law of nature centered around a concept that is even more abstract than the previous two concepts: the notion of electron number, which involves regarding one set of particle types (including both charged and neutral particles) as positive, and another set of particle types (including both charged and neutral particles) as negative. Here is a notion so abstract that a very small child could probably never even hold it in his or her mind, but somehow nature not only manages to hold the notion but enforce a law involving it whenever two particles collide at high speeds.

The examples of particle collisions given above are simple, but when particles collide at very high speeds, the outputs are sometimes much more complicated. There can be more than 50 particles resulting from a high-speed proton collision at the Large Hadron Collider. In such a case nature has to instantaneously apply at least five laws, producing a solution set that has many different constraints.

For historical reasons, the nature of our current universe depends critically on the laws described above. Even though these types of high-speed relativistic particle collisions are rare on planet Earth (outside of particle accelerators used by scientists), these types of particle collisions take place constantly inside the sun. If the laws above were not followed, the sun would not be able to consistently produce radiation in the way needed for the evolution of life. In addition, in the time immediately after the Big Bang, the universe was one big particle collider, with all the particles smashing into each other at very high speeds. If the laws listed above hadn't been followed, we wouldn't have our type of orderly universe suitable for life.

By now I have described in some detail the behavior of nature when subatomic particles collide at high speeds. What words best describe such behavior? I could use the word “fixed” and “regular,” but those words don't go far enough in describing the behavior I have described. The best words I can use to describe this behavior of nature when subatomic particles collide at very high speeds are these words: *programmatic* and *conceptual*.

The word *programmatic* is defined by the Merriam Webster online dictionary in this way: “Of, relating to, resembling, or having a program.” This word is very appropriate to describe the behavior of nature that I have described. It is just as if nature had a program designed to make sure that the balance of positive and negative charges does not change, that the

number of protons plus the number of neutrons does not change, and that overall lepton number does not change.

The word *conceptual* is defined by the Merriam Webster online dictionary in this way: “Based on or relating to ideas or concepts.” This word is very appropriate to describe the behavior of nature that I have described. We see in high-speed subatomic particle collisions that nature acts with great uniformity to make sure that the final stable output particles are one of the five types of particles in the list above (protons, neutrons, photons, electrons, and neutrinos). It is just as if nature had a clear idea of each of these things: the idea of a proton, the idea of a neutron, the idea of a photon, the idea of an electron, and the idea of a neutron. As nature has a law that conserves net charge, we must also assume that nature has something like the idea of net charge. As nature has a law that conserves baryon number, we must also assume that nature has something like the idea of baryon number. As nature has a law that conserves lepton number, we must also assume that nature has something like the idea of lepton number.

So given very important and fundamental behavior in nature that is both highly conceptual and highly programmatic, what broader conclusions are implied? We are nudged towards the idea that nature has been specifically designed for a purpose. The laws of nature discussed here are very strong hints of cosmic purpose. Part of that purpose is apparently the eventual appearance of intelligent creatures like us, something that is facilitated by the laws discussed here.

29. Anecdotal Evidence for ESP

Earlier I discussed experimental evidence for ESP gathered in laboratories. There is another widespread form of evidence for ESP: anecdotal evidence from ordinary people during everyday life.

A 2005 Gallup poll revealed that 41% of the US population believes in ESP (in a 1990 poll 49% said they believed in ESP). But there has been very little publicity given to ESP experimental research during the past 15 years, and my guess is that is 9 out of 10 Americans could not identify what a ganzfeld experiment is (the most successful widely produced type of experiment for ESP). So why do 41% or more of Americans believe in ESP? Is a large fraction of the US population reading hard-to-read parapsychology papers in journals with little readership, papers with thick jargon-laden verbiage in which the meaning is buried in discussions of p-values? Given the notoriously weak reading habits of modern Americans, I find that very hard to believe. It's also not because of TV shows popularizing ESP (ghost shows are currently popular, but I know of no

shows on ESP). Nor is it because of anyone being taught that ESP exists, as psychology courses are notoriously bad about mentioning the topic.

A more likely explanation is that 41% or more of the US population believes in ESP because a large fraction of them have personally experienced something like ESP. The same thing may explain why 59% of Australian women believe in ESP, and why in a poll of 1006 adults 43% reported reading others' thoughts or having theirs read.

One extremely common type of ESP experience is to be thinking of some distant friend or relative just before answering a phone call from that person. In a poll of 1006 adults, 62% said they could tell who was calling before answering the phone. Another common ESP experience is to sense when someone is staring at you, even though you can't see that person. Two thirds of those 1006 adults reported such an experience. Another extremely common type of ESP experience is for someone to have an unlikely thought, and then hear a second person in the same room state the same thought, before the first person said anything.

I had a dramatic experience like this myself. My two daughters and I were looking at a feline animal called a puma, which we could see distantly, far behind a plastic barrier. Suddenly (oddly enough) I had a recollection of a zoo visit I had ten years ago, when I saw a gorilla just behind a plastic barrier, at the zoo at Busch Gardens in Florida. About three seconds later (before I said anything), my younger daughter (a teenager) said, “Do you remember that gorilla we saw close-up in Busch Gardens?” I was flabbergasted. It was as if there was telepathy going on. The incident seems all the more amazing when you consider that teenagers live very much in the present or the near future, and virtually never talk about things that happened 10 years ago. There was nothing in our field of view that might have caused both of us to have that recollection at the same time. On that zoo visit we hadn't seen a gorilla, nor had we seen any animal near a plastic barrier.

When we moved to the next zoo exhibit, just for laughs I asked my older daughter whether perchance she also was thinking of that gorilla we saw 10 years ago, before anyone mentioned the gorilla. My jaw dropped when she reported: yes, she also was thinking of that gorilla we saw ten years ago in Busch Gardens, before anyone had said anything about it. So apparently before anyone said anything, we had three out of three people all recalling the same very distant memory – a memory of seeing a gorilla ten years ago. How do you explain such a thing without a hypothesis of something like ESP? The odds of such a coincidence seem less than 1 in a billion.

Many cases such as these have been written up in the Journal of the American Society for Psychical Research, the Journal of Parapsychology and the British Journal of the Society for Psychical Research. A very good and easy-to-read collection of hundreds of anecdotes of ESP during everyday life can be found in the book *The Gift: ESP, the Extraordinary Experiences of Ordinary People* by Sally Feather Rhine and Michael Schmicker.

One common type of ESP often experienced out of the laboratory is what is sometimes called *crisis telepathy*. Suddenly someone may have a very strong feeling that a family member is in danger or in trouble. Upon making a telephone call or inquiry, the person finds that the other person he thought about is in danger or has already suffered some injury (such as a stroke or a car accident), or perhaps death. This type of telepathy is supposed to occur more often in twins.

For example, in 1977 Martha Burke felt as if she had been cut in half. Hours later she found her sister had died in a plane crash. Similarly, in 1975 Nita Hurst felt agonizing pain for no apparent reason. She later discovered that her twin had been seriously injured in a car crash that occurred at the same time as Nita's pain. On a Thanksgiving day a daughter had a very strong feeling that her mother was not well. Her mother had died at a distant location at exactly the same time. During another family meeting, a woman stood up and screamed that something had happened to her mother. She learned 15 minutes later by a phone call that her mother had died.

While at work a twin had an overwhelming feeling that his twin was trying to contact him. So he left work early, and three minutes after returning home, he was told that his twin had suffered a massive heart attack. In another case a mother had a severe pain in her right hand at the same time that her daughter far away got a severe burn on her right hand. A man cried out that his Uncle Joe had been shot shortly before learning that his Uncle Joe had been murdered far away. A daughter felt horrible pain in her arm the same afternoon her father had an arm accident requiring an amputation.

But is this anecdotal evidence for ESP really a hint of cosmic purpose? Yes, it is. It is because there is simply no way to account for ESP in humans by using the assumptions of materialism, the theory that our consciousness is simply a by-product of brain activity. If ESP exists, there must be something far greater to human consciousness, and we presumably are not just by-products of neuron activity, but some kind of souls or spirits that we might expect to survive bodily death. Such a state of affairs hints at a purposeful universe, rather than the blind-chance

universe of materialism. Materialists no doubt sense how incompatible ESP is with their assumptions, which is why they are so stubborn about refusing to accept the abundant evidence for ESP.

30. Terminal Lucidity

Terminal lucidity is a phenomenon in which people with greatly diminished mental functions suddenly become lucid just before their deaths. An interesting case is that of Anna Katharina Ehmer, a 26-year-old woman who supposedly had never spoken a word in her life. Having severe mental problems, she lived in a mental institution. A doctor reported her condition as follows:

Käthe was among the patients with the most severe mental disabilities who have ever lived in our institution. From birth on, she was seriously retarded.
She had never learned to speak a single word. She stared for hours on a particular spot, then she fidgeted for hours without a break.

What was astonishing about this patient was how she died. Below is the account of a witness at the time, matched by another witness:

One day I was called by one of our physicians, who is respected both as a scientist and a psychiatrist. He said: "Come immediately to Käthe, she is dying!" When we entered the room together, we did not believe our eyes and
ears. Käthe, who had never spoken a single word, being entirely mentally disabled from birth on, sang dying songs to herself. Specifically, she sang over and over again "Where does the soul find its home, its peace? Peace, peace, heavenly peace!" For half an hour she sang. Her face, up to then so
stultified, was transfigured and spiritualized. Then, she quietly passed away.
Like myself and the nurse who had cared for her, the physician had tears in his
eyes.

According to the same scientific paper, in 1861 someone named Perty reported the case of a man with intellectual capacities no greater than a dog or money. But four days before the man died, according to Perty, he entered into a clear mental state and surprised everyone with his clear thoughts and speech. In 1865 a man suffered a stroke that left him paralyzed for 11 years. He lost his ability to read and speak. Then he suffered another stroke. But in his last week he was able to speak in full sentences and understand what people were saying.

In another scientific paper, authors found 49 cases of terminal lucidity. Another review of terminal lucidity found 83 cases published by 55 different authors. In one study by Brayne, 7 out of 10 caregivers at a nursing home reported that they had seen patients with dementia or confusion become lucid in their last days.

In his paper "Lightening Up Before Death," A.D. Macleod found six cases of terminal lucidity among 100 consecutive hospice deaths.

In one case in 1820 a nun went "raving mad," and was confined to an asylum. Three weeks before her death she became inexplicably lucid, calm, and thankful, remembering her history well. An autopsy revealed a highly diseased brain that should have prevented normal brain functioning. Haig in 2007 reported the case of a young man dying of brain cancer. A brain scan showed little brain tissue left. In the days before his death he lost all ability to speak and move. Yet an hour before he died he was able to carry on a five-minute conversation with his family.

Terminal lucidity suggests that death may not be the end of consciousness, but simply a transition to an afterlife. Terminal lucidity cases therefore provide a soft hint of cosmic purpose.

31. The Flatness Problem

The flatness problem is a fine-tuning problem involving the Big Bang, the universe's origin from a hot and dense state 13 billion years ago (according to cosmologists, an infinitely dense and infinitely small mathematical point called a singularity). According to cosmologists, when the universe began it started to expand at just the right rate. If the universe had started to expand at a tiny bit faster rate, it would have expanded so quickly that galaxies would not have formed from gravitational contraction. If the universe had started to expand at a tiny bit slower rate, the gravitational attraction from the universe's matter would have caused the universe's matter to form into super-dense black holes rather than galaxies.

The physicist Paul Davies puts it this way:

For a given density of cosmic material, the universe has to explode from the creation event with a precisely defined degree of vigor to achieve its present structure. If the bang is too small, the cosmic material merely falls back again after a brief dispersal, and crunches itself to oblivion. On the other hand, if the bang is too big, the fragments get blasted completely apart at high speed, and soon become isolated, unable to clump together to form galaxies.

How finely balanced did this expansion rate have to be in order for there to be a universe like ours, in which galaxies exist? Scientists say that it had to be balanced to at least one part in 10 to the thirtieth power (1 part in 1,000,000,000,000,000,000,000,000,000,000). In other words, if the universe had expanded at a rate only .
000000000000000000000000000001 faster or slower, it would not have galaxies, and would not have life.

The calculation given here is not some oddball conclusion made by only one or two scientists.
A statement like the statement above has made in innumerable scientific books and papers. Look up any of the many discussions of the theory called the cosmic inflation theory, and you will see claims like the ones above.

What is the chance of the universe accidentally having just the right expansion rate? According to the numbers given above, the chance is about 1 in 1,000,000,000,000,000,000,000,000,000,000. That is something that is just about as likely as you meeting three strangers, and correctly guessing all three of their ten-digit social security numbers, without missing a single digit.

Now scientists don't like to live with a case of fine-tuning this extreme. The flatness problem makes the universe look super-calibrated, like some very carefully designed creation. That type of thing makes many scientists uncomfortable. So pretty much as soon as scientists discovered this flatness problem, they created a theory to try to explain it away. The theory is called the cosmic inflation theory. The theory attempts to give a natural explanation for why the universe began to expand at just the right rate.

For 34 years scientists have been fiddling around with different versions of this theory, trying to make a good plausible version of it. They have not succeeded yet. All versions of the cosmic inflation theory require a great deal of fine-tuning in themselves. So it's kind of like robbing Peter to pay Paul. There is no evidence for the cosmic inflation theory. If you do a Google search trying to find evidence, you will find results referring to the BICEP2 study. But that study now appears to be a false alarm, and the observations reported by BICEP2 can just as easily be explained as the result of dust and gravitational lensing, not cosmic inflation.

Perhaps the most decisive point against the cosmic inflation theory comes when we consider the consequences of the theory. The cosmic inflation imagines that in the first fraction of a second of the universe's existence,

the universe underwent exponential expansion, which is sometimes described as resembling the blowing up a soap bubble. But according to the cosmic inflation theory, there would not have been just one such bubble, but a vast number of them. Each of these bubbles would be kind of like a bubble universe, and almost all of them would be too small or too big for galaxies to appear. What would be the ratio between the unsuitable bubble universes and the suitable bubble universes? Much, more than 1,000,000,000,000,000,000,000,000,000,000,000,000,000,000. This issue is sometimes referred to as the "youngness paradox."

So what is the inflation theorist's answer to why we live in one of the lucky bubbles that is suitable for intelligent life? He will have to answer something that boils down to, "We just lucky." But a theory that is designed to avoid a lucky coincidence with a likelihood of 1 part in 1,000,000,000,000,000,000,000,000,000,000,000 (the flatness problem) is worthless if that theory requires you to believe in another lucky coincidence that has a likelihood of much less than 1 part in 1,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000.

The cosmic inflation theory is therefore what we can call a "Cane Toad solution" – a "solution" that introduces more problems than it solves. The term "Cane Toad solution" is derived from a species of toad introduced into Australia to solve a beetle problem, an act which led to bigger environmental problems than any that were solved (as the toads proliferated to a population of 200 million).

In short, the theory of cosmic inflation fails as an attempt to explain away the flatness problem, the issue of why the universe had just the right expansion rate, with an exquisite degree of balancing requiring a fine-tuning to 1 part in 1,000,000,000,000,000,000,000,000,000,000,000,000. The issue cannot be explained away. It is a very strong hint (or what we might even call a sign or signature) of cosmic purpose. The flatness problem very strongly suggests that our universe's expansion rate at the time of the Big Bang was very carefully selected by some cosmic intelligence.

32. The Existence of Fundamental Forces

The universe has four known fundamental forces. The weakest by far is gravitation. The other three are electromagnetism, the weak nuclear force, and the strong nuclear force. These forces are crucial determinants of the nature of our universe. Gravitation holds planets and stars and galaxies together. The strong nuclear force holds the nucleus of an atom together. Electromagnetism is absolutely necessary for the existence of any type of chemistry or biology. The effects of the weak nuclear force are more

subtle, but at least one scientist has argued that it would be very hard to have intelligent life without the weak nuclear force.

We take these fundamental forces for granted, because they have always been around. We fail to appreciate the four fundamental forces. Similarly, if there existed a law of nature which caused all objects to gently and gradually decelerate at the end of a fall, we might call it “the law of soft landings,” and we would take such a law for granted, failing completely to appreciate it.

But we must ask: is there anything inevitable about the existence of the four fundamental forces? Is there any reason why all of them or any of them have to exist? The answer is: no, there is not. In fact, if we are going to imagine random universes, it would seem that the most likely universe would be one that has no fundamental forces at all: neither gravitation, nor electromagnetism, nor the weak nuclear force, nor the strong nuclear force.

What explanation does science give for why the fundamental forces exist? A physicist might attempt to explain the forces in terms of the exchange of virtual particles that is made possible by Heisenberg's uncertainty principle. But this does not amount to any coherent explanation of why any of the four fundamental forces has to exist. For one thing, there are many reasons for doubting the credibility of this explanation, which involves ideas such as the idea that your little finger is now exchanging virtual particles with every star, galaxy and planet in the universe. For another thing, such an explanation involves a dependence on Heisenberg's uncertainty principle, which depends on Planck's constant, something that could just as easily have a value of 0.

What happens if we use all of the current equations and theories for fundamental forces, but simply imagine a Planck's constant of 0, and a gravitational constant of 0 (along with zero values for anything that seems to indirectly depend on Planck's constant, such as the electric coupling constant)? The result is that there would be no fundamental forces – no gravity, no electromagnetism, no weak nuclear force, and no strong nuclear force. You can't object that Einstein's theory of general relativity requires matter to warp space in a way that creates gravitation, because if we assume a gravitational constant of 0, then Einstein's theory of general relativity predicts no warping of space, and no gravitation. There is also no reason why general relativity itself has to exist.

This seems, in fact, like the most simple and plausible description of a random universe – one with no fundamental forces at all. We can imagine such a universe as simply a disordered soup of particles colliding with

other. If you want to get a visual image of such a universe, imagine one of those lottery machines in which the little white balls are floating around and colliding with each other randomly. But instead of little white balls, you would have subatomic particles bouncing off each other randomly. There would be no atoms in such a universe, because there would be no strong nuclear force and electromagnetism to allow atoms. There would be no molecules. There would be no stars and no planets, as both require gravitation. There also certainly would not be life. The universe would be cold, dark, and lifeless, just a great big disordered mass of subatomic particles randomly bumping into each other.

That is how we would expect a random universe to be, in a state of disordered chaos. The very existence of fundamental forces (such as the four fundamental forces of our universe) is a strong hint of cosmic purpose, a hint that some intelligence set our universe up with exactly the forces needed for an orderly universe that contains life.

33. Apparitions Seen by Multiple Witnesses

Skeptics try to explain away sightings of apparitions by dismissing them as hallucinations. It's not a very plausible explanation, as most apparitions are seen by people without any psychiatric history. Outside of apparition sightings, there is not the slightest reason to think that normal people without psychiatric histories sometimes see visual hallucinations. If such hallucinations happened, they would take on a variety of forms, such as hallucinations of animals and hallucinations of robots and hallucinations of monsters. But normal people without psychiatric history never have reported such hallucinations.

Another reason for dismissing the “apparitions are all hallucinations” theory is that quite a few times the same apparition has been seen by multiple witnesses. One such case is the remarkable case of the apparition seen by the Blaisdel family in 1800. The apparition reportedly claimed to be the deceased wife of a man who wanted to marry a daughter of the family's father. The apparition was reported to have carried on conversations with family members, recalling details of previous conversations had with them. The apparition was first seen as a mass of light, and then reportedly took on a more personal shape. After being witnessed by more than 50 people, the appearances of the apparition stopped after 8 months.

Another such case is the so-called Morton ghost or Cheltenham ghost seen by Rosina Clara Despard and 16 others between 1882 and 1889. When 19 the woman saw an apparition of a tall woman dressed in black. The

apparition was seen more and more often during the next 7 years, by Rosina and 16 others. Rosina reportedly touched the apparition several times, only to watch it vanish.

In 1907 Rosa B. Sutton was told that her son had died of a suicide. She reported that soon after an apparition of her son appeared, to tell her that the story was false, and that he had been murdered. The apparition was also reported by other family members and friends. Details of the "tale told by the apparition" were supposedly verified to be correct.

Another remarkable case with multiple witnesses is the case of the apparition of Samuel Bull reported in 1931. Four months after he died, an apparition looking just like him was seen walking about the family home, and passing through a closed door. The apparition was seen by nine members of the family, both singly and in groups, over the next two months.

Bill and Judy Guggenheim have described several cases of apparitions seem by multiple witnesses at the same time. In one case a woman reported seeing an apparition of her father at night four months after he died. The next morning her son reported seeing the same thing. In another case a wife and her husband both reported seeing an identical apparition of the wife's mother, seen a few days after she died of cancer.

Perhaps the most remarkable case of a multiple-witness apparition sighting is the famous case of the "Ghosts of Flight 401." In December, 1972 Eastern Airlines Flight 401 crashed into the Florida Everglades. Among more than 100 dead were the pilot Bob Loft and the flight engineer Dan Repo. On several later flights of Eastern Airlines, Repo and Loft were reportedly seen by multiple witnesses. A flight attendant and a passenger supposedly saw a man in an airline uniform seated in the aircraft. The man reportedly disappeared in front of multiple witnesses. The man was later identified as Dan Repo.

On another occasion a flight attendant (Faye Merryweather) and two others allegedly saw Repo give a warning of fire on the airplane. The plane later encountered serious engine trouble on the same flight. One of the vice presidents of Eastern Airlines reportedly spoke to a uniformed captain sitting in first class. The executive reportedly recognized the captain as Bob Loft, at which point the apparition disappeared.

In another incident Loft reportedly appeared before a flight captain and told him, "There will never be another crash. We will not let it happen."

Cases in which multiple witnesses see the same apparition refute the

skeptic's claim that apparition sightings are mere hallucinations. Groups of people don't have the same hallucination. Because they provide evidence for an afterlife, these apparition sightings with multiple witnesses provide a hint of cosmic purpose.

34. Quantization and the Persistence of Atoms

Each atom has one or more protons inside the nucleus that makes up the atom's center. Orbiting those atoms are electrons. Protons are positively charged particles, and electrons are negatively charged particles. There is a force of attraction between any proton and any electron. So why don't electrons fall all the way into the nucleus of atoms? The original answer given by some around 1900 was that the high speed orbits of the electrons produced an outward centrifugal force which balanced the inward force of attraction between protons and electrons. According to this early answer, electrons kept in their orbits around the nucleus for the same reason that the planets keep in orbit around the sun.

But later calculations showed that this answer was wrong. According to the best calculations physicists could produce around 1905, the electron should indeed fall into the nucleus. It was a crisis in physics. Just after figuring out the basics of atoms, the physicists seemed to have proved that atoms should not even exist.

The crisis was solved by the advent of quantum mechanics. According to the weird rules of quantum mechanics, inside an atom the energy levels of electrons are restricted to certain amounts, something called quantization. Physicists now said that rather that switching gradually from one energy state to another, electrons make *quantum jumps* from one energy state to another (instantaneous transitions). Imagine if planet Earth were to instantly jump from its current orbit to an orbit between Venus and Mercury. That is kind of what happens during a quantum jump.

Because of the miracle of quantum jumps, atoms are able to persist. Each quantum jump requires a particular amount of energy, and the amount of energy needed for an electron to jump all the way to the nucleus is too great. So electrons don't fall into the nucleus, and atoms are able to persist.

Another way to think of an electron's orbit is to think of an electron cloud. An electron cloud can be thought of a range of positions, and we can say that the electron may be anywhere in that cloud (or we might say that the electron is “spread out” throughout the cloud). An electron cloud may look like a sphere, a ring, a horizontal ring intersecting a vertical ring, or one of various other shapes. What happens during one of these quantum jumps, in which the energy state of the electron changes in an atom? From

the electron cloud perspective, a quantum jump is like an instantaneous change in appearance. When a quantum jump occurs, an electron instantaneously changes from one shape to another shape. It's as amazing as if you had an apple that instantly changed into the shape of a banana.

The behavior of electrons within atoms seems all the more remarkable when one considers that as soon as electrons move outside of an atom, they follow an entirely different rule of conduct. Outside of an atom, the energy levels of electrons are not quantized. Outside of an atom, an electron can have any energy level whatsoever. It is as if nature had been carefully programmed, so that electrons would follow some rule that allows the existence of atoms, but only when an electron becomes part of an atom.

The quantization of energy levels in an atom is an example of a highly orderly behavior of matter that is astonishing and surprising on different levels, behavior we should not expect to see in a random universe. The behavior of electrons in an atom seems systematic and programmatic. Such behavior (and the resulting persistence of atoms) is therefore a hint of cosmic purpose, a hint that our universe has been carefully set up to allow the existence of atoms and beings made up of atoms.

35. Out-of-Body Experiences by Healthy People

Out-of-body experiences are experiences in which people report drifting out of their body and being able to move around outside of their body. Such experiences are reported during near-death experiences, but they have also been reported by healthy people. The web site http://www.oberf.org/ gives many accounts of out-of-body experiences by healthy people.

One strange type of reported experience is what is known as a spontaneous out-of-body experience, or SOBE. People who have had such experiences may report that they were engaged in some activity (often meditation), and that suddenly they seemed to be able to move around outside of their body. Other people have reported being able to produce out-of-body experiences at will. One such person was named Robert Monroe. A psychology graduate student at the University of Ottawa says she can voluntarily enter an out-of-body experience.

Some out-of-body experiences fall under a category known as shared death experiences. These type of experiences were described in Dr. Raymond Moody's book *Glimpses of Eternity*. An example of such an experience occurred to the noted German poet Karl Scala. On a battlefield he huddled in a foxhole with a dying man hit by a shell. Scala reported

rising out of his body with the soul of the dying man, as the man died. He said he could look down and see himself holding the dying man. He saw himself and the dying man rising to a bright light, but then found himself back in the foxhole, with the dead body of the dying man.

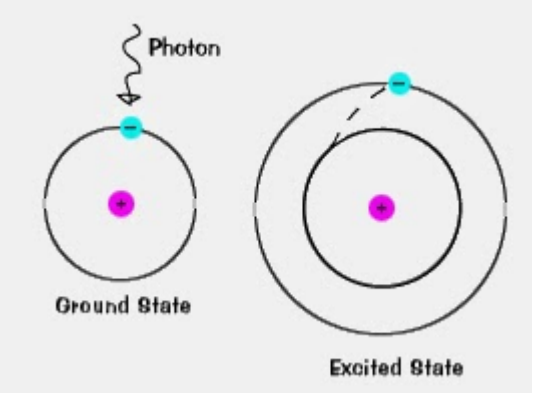
A psychology professor named Charles Tart did a scientific study with a woman identified as Miss Z, who claimed to have spontaneous out-of-body experiences two to four times a week. The woman was put in a special observation room that was carefully monitored. A randomly generated five-digit number was placed on a shelf over her head. The woman later claimed to have had an out-of-body experience while under observation in the room. She claimed to know the number that was on the shelf, even though she had not been observed looking at it. The number she reported proved to be the correct number.

Skeptics claim that the number could have been seen as a reflection on a clock that was near the shelf, but Tart makes it clear that he tested this idea, and found that the number could only be seen if a flashlight was shining on the number. There was no such light.

Because they suggest that we have a soul that survives death, out-of-body experiences provide a hint of cosmic purpose.

36. The Programmatic Behavior of Electrons

A quantum jump is one of the strangest things in quantum mechanics. A quantum jump occurs when an electron jumps from one orbit in an atom to another (or more strictly, from one quantum state to another). A quantum jump is typically triggered when an energetic photon strikes the electron. The following very crude diagram illustrates the idea. It shows an electron being struck by a photon of energy, with the electron jumping to a new orbital position. (I am speaking a bit schematically here.)



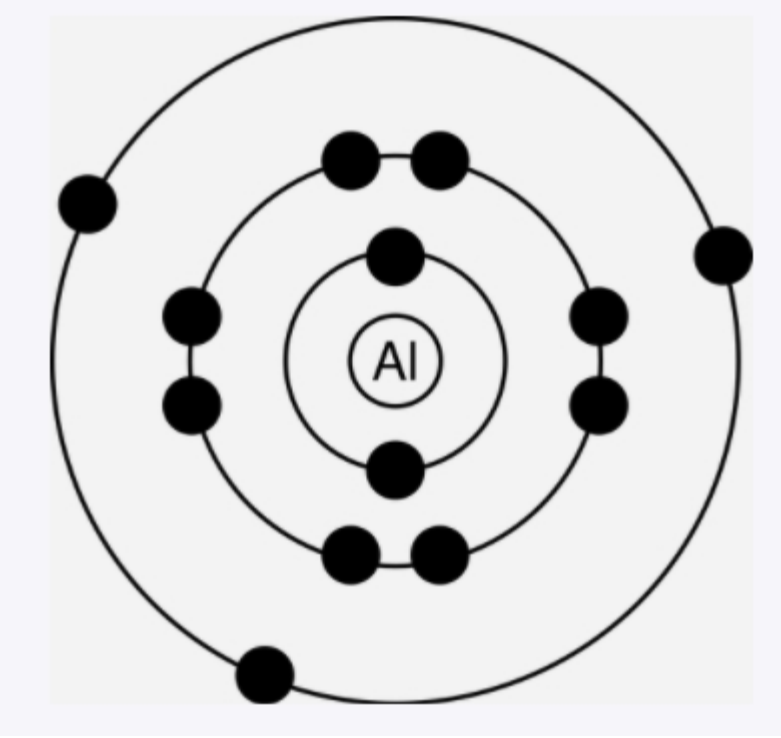
However, the actual jump does not occur as a journey from one orbit to

another, as shown in this crude visual. The jump occurs as an instantaneous transition from one orbit to another (or more precisely, from one quantum state to another). The opposite of the process depicted above also frequently happens. An electron will jump to an orbit closer to the nucleus, causing a photon to be emitted.

Now, in physics there is a very important law saying that in an atom no two electrons can have the same quantum state. This law is known as the Pauli Exclusion Principle. What this roughly means is that no two electrons with the same spin can have the same orbital state.

Imagine an atom with many electrons having many different orbits. In such a case a photon may strike an electron, causing it to jump to a new orbital position. But if the atom already has many electrons, the jump must occur in a way that obeys the Pauli Exclusion Principle. Depending on the intensity of the photon, the electron might have to jump over numerous different orbits, finding a slot for it to jump to that is compatible with the Pauli Exclusion Principle.

For example, a photon might hit an electron in one of the inner orbits in an atom like the one depicted below, causing it to jump to one of the outer orbits (the distance would depend on how energetic the photon was).



But in this case the electron does not “try” various orbital positions,

ending up in the first one that is compatible with the Pauli Exclusion Principle. Instead the electron instantaneously jumps to the first available orbital position (consistent with the photon energy) that satisfies the Pauli Exclusion Principle.

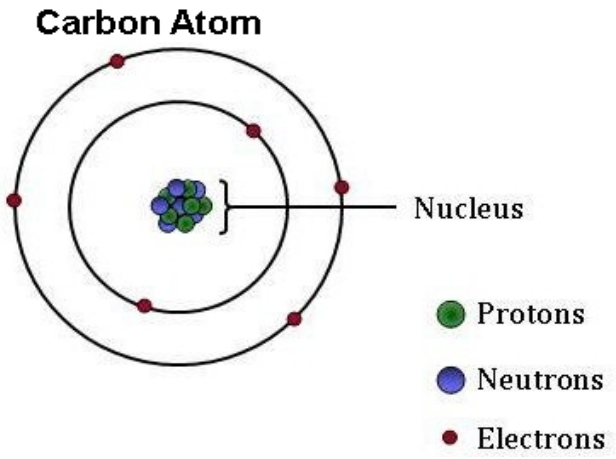
Now the question is: how does the electron "know" exactly the right position to instantaneously jump to in this kind of complicated situation? And how do electrons "know" that they are supposed to obey the Pauli Exclusion Principe? I may note that physicists say that if electrons did not follow the Pauli Exclusion Principle, there would be no solid matter.

It is as if nature was somehow programmed to achieve an orderly end result. When electrons follow the Pauli Exclusion Principle, they do not seem to act in some blind, random way. They seem to act in a systematic way that guarantees orderly solid matter like that which is necessary for life. It is as if each electron has been instructed with a set of rules of behavior at its creation. This situation provides us with a strong hint of cosmic purpose. It is as if nature has been deliberately programmed so that electrons behave in a way that leaves us with solid matter and a wide variety of orderly atoms.

37. The Fine-Tuned Carbon Resonance

Oxygen and carbon are elements absolutely necessary for life, being crucial requirements for things such as DNA, RNA, proteins, and any complicated molecules. You cannot build complex molecules out of only the simplest elements such as hydrogen and helium; you need elements such as carbon and oxygen. We take for granted that the universe has the elements needed for our existence. But scientists who have investigated the origin of elements have found that there we got quite a lucky break in order to end up with a universe in which there is plenty of oxygen and carbon.

There was no appreciable carbon or oxygen produced in the Big Bang at the beginning of the universe. The only elements produced were hydrogen, helium, and a little lithium. Almost all of the carbon and oxygen in our universe were produced in stars. Stars are made up mainly hydrogen and helium, but there is a way that they can produce carbon. First, a helium nucleus (consisting of two protons and two neutrons) and another helium nucleus combine to form a beryllium-8 nucleus (consisting of four protons and four neutrons). Then that beryllium-8 nucleus combines with another helium nucleus to produce a carbon-12 nucleus (consisting of 6 protons and 6 neutrons).



But this is an extremely tricky affair that is a little like jumping out of one convertible car moving in one direction and landing in another convertible car traveling in another direction. It's so tricky because the beryllium-8 nucleus has only an extremely short lifetime of only the tiniest fraction of a second. Were it not for a particular lucky break regarding the carbon-12 nucleus, it would not be possible to form a carbon-12 nucleus from the combination of the beryllium-8 nucleus and the helium nucleus.

The lucky break I refer to is something that physicists call a resonance. The resonance is kind of a special excited state of the carbon-12 nucleus that makes it possible for carbon-12 to be abundantly formed from the berylium-8 nucleus and the helium nucleus.

Scientists have analyzed the factors that cause this special and very lucky carbon-12 resonance. They say it depends in part on the strong nuclear force. In a scientific paper entitled "Fine-tuning the basic forces of nature through the triple-alpha process in red giant stars," Csoto, Oberhummer, and Schlattl declared that a change of only half a percent in that force would mess up the lucky carbon resonance, and lead to a universe that does not have an appreciable amount of carbon or oxygen. Another scientific paper ("The Triple-Alpha Process and the Anthropically Allowed Values of the Weak Scale" by Jeltema and Sher) says that the special carbon resonance requires that the "Higgs vacuum expectation value" must have a numerical value between 90% of its current value and five times its current value. If this "Higgs vacuum expectation value" did not have a numerical value within this narrow range, the lucky carbon resonance would not exist, and we would not live in a universe with abundant carbon and oxygen.

Other scientists such as John D. Barrow have shown that if you change the physics of the universe just a tiny bit in one direction, you get a universe with abundant carbon but very little oxygen; and if you change the physics

of the universe just a little bit in another direction, you get a universe with abundant oxygen but very little carbon. Getting *both* abundant oxygen and abundant carbon requires great luck, and is something like an archer hitting the bullseye with his arrow.

The special carbon resonance was originally predicted by astronomer Fred Hoyle, who said that it had to exist in order for abundant carbon to be formed. After later finding out that just such a lucky resonance does exist, he remarked, “A commonsense interpretation of the facts suggests that a superintellect has monkeyed with physics.” The lucky carbon resonance isn't by itself proof of a cosmic designer who carefully set up things so that our universe would have abundant carbon and oxygen. But it is at least a hint of such a thing, and is therefore a hint of cosmic purpose.

38. The Early Universe's Smoothness and Low Entropy

Entropy can be roughly defined as the amount of waste mass-energy in a system or universe, energy that is unavailable for work. Entropy is increased when stars burns up their nuclear fuel to radiate energy into space, and it is also increased when matter gets trapped in black holes. It is a fundamental law of nature that entropy gradually increases as time passes, a principle known as the Second Law of Thermodynamics. Scientists say this law will eventually lead in the incredibly distant future to a “heat death” of the universe, in which there is no usable energy. Such an event is projected to take place many trillions of years in the future, long, long after the sun has burnt out.

We know roughly how much entropy is now in the universe, and if we “rewind the film” backward all the way back to the time of the Big Bang, we then have a universe that begins with very, very little entropy. The entropy level at the time of the Big Bang (the beginning of the universe) is some incredibly low entropy near the minimum possible entropy that a universe can have.

Roger Penrose (one of the most famous cosmologists) has emphasized the fantastic specialness of the low-entropy state of the early universe. In the youtube.com video below, Penrose discusses the issue.

http://www.youtube.com/watch?v=GvV2Xzh11r8

At the end of this brief clip Penrose estimates that the chance of a random universe having entropy as low as the entropy in the early universe is some inconceivably small number such as 1 in 10^N, where N is a number greater than the total number of particles in the observable universe.

Cal Tech Physicist Sean Carroll has pointed out the early universe was very smooth, in a way that seems astonishing improbable. Such almost perfect smoothness, Carroll points out, would not occur in more than the tiniest fraction of the trajectories that the universe might have had after an event such as the Big Bang. How small is that fraction? On page 21 of a scientific paper Carroll estimates that "the total fraction of the trajectories that are smooth at early times" is very roughly 1 in 10 *to the 66 millionth power*. That's a fraction equal to 1 in *x*, where *x* is 10 followed by 66 million zeroes. Carroll says of his estimate, "This represents a very conservative estimate for the amount of fine-tuning involved in the standard cosmological model."

Carroll also states:

We can therefore conclude that the smoothness of the early universe does indeed represent an enormous amount of fine-tuning... The history of our actual universe does not look anything like it was chosen randomly.

Carroll probably came to such a conclusion reluctantly, as he is not a theist.

To call the early universe's astonishingly low entropy and smoothness a hint of cosmic purpose would seem to be an understatement. It would be more accurate to call such a thing a sign or signature of cosmic purpose. The ever-so-improbable smoothness and low entropy of the early universe seems like something that is shouting to us in a very loud voice that the universe was carefully fine-tuned to be orderly. There seems to be no way to avoid such a conclusion by imagining any theory of an eternal universe. The fact that entropy always gradually increases (the second law of thermodynamics) makes it basically impossible to construct any workable theory of an eternal universe. Any universe that had existed forever would have a level of entropy much more than trillions of times higher than the entropy level we observe in the universe. Entropy and the second law of thermodynamics are the ultimate killers of any theory of a universe that has existed forever.

39. Verified Premonitions

Verified premonitions can be defined as cases in which someone has a feeling or dream about something that is going to happen in the future, only to later find just such a thing did happen. Many fascinating cases have occurred in human history.

On May 3, 1812, John Williams had the same dream three times in a single night: a very specific dream about someone assassinating Spencer

Perceval, the British Prime Minister. Eight days later Perceval was assassinated, and several of the details matched William's dream.

Two weeks before he was assassinated, Abraham Lincoln had a dream that he would be assassinated. The famous writer Mark Twain had a dream about the death of his brother that turned out to closely match what happened a few days later. Several people had premonitions that something would go wrong on the Titanic before it sunk. One person who had a ticket on the ill-fated ship had two dreams that the ship would overturn, with passengers in the water.

In 1950 a church blew up in Beatrice, Nebraska, at a time when the church normally would have had a choir practice. Amazingly, no one was hurt, because the church was empty. We can only guess at how many of these people felt a premonition of doom, and avoided their regular choir practice.

In one case reported to the Rhine Research Center, a mother had a dream that a chandelier fell on her baby sleeping in another room, and that this occurred at 4:35 AM. She then moved the baby into her own room. Later in the night she heard a tremendous crash. The chandelier had fallen on the spot where the baby had previously slept. Looking at the clock, she saw it was 4:35 AM.

In another case Dr. Larry Dossey reported that a woman came to him saying she had a dream in which there were three white spots on her ovary. A radiologist investigated, finding that the three white spots did indeed exist on her ovary.

According to research published in the Journal of the Society for Psychical Research, dozens of people had premonitions of disaster before the Aberfan avalanche that killed 144 people. Some had dreams about such a disaster before it happened.

During World War II Winston Churchill had two premonitions that may have saved his life or those of others. One premonition led him to switch sides on his staff car. A bomb then went off on the side he moved away from. Another premonition led him to tell his kitchen staff to leave the kitchen and go underground. A bomb then destroyed the kitchen.

A number of people also had premonitions of the September 11, 2001 attacks on the World Trade Center. In early September, Lawrence Francis Boisseau had a dream that the World Trade Center was collapsing around him. Boisseau was killed in the attack.

Several months before September 11, 2001, I also had a dream that the World Trade Center was collapsing. In my dream I was an observer inside the World Trade Center. The floor collapsed, and I plunged without stopping. I then woke up. I later told my wife I had a dream the World Trade Center was collapsing. I have never had a dream about any other building collapsing.

The four planes involved in the September 11, 2001 attacks were only 21% occupied, which some see as evidence that many people had premonitions that something was going to go wrong on that day. There are many web sites devoted to premonitions of September 11, 2001.

Numerous cases of verified premonitions are told in the book *The Gift* co-authored by Dr. Sally Feather Rhine, including quite a few of mothers with premonitions of danger that were soon verified. The book states, "Again and again, the same type of experience is repeated...The main difference is how the mother receives the psychic warning, with scary precognitive dreams and sudden, panic-inducing psychic situations most frequently reported. Foreseen events typically take place quite soon."

All in all there is a great deal of anecdotal evidence that humans can get paranormal premonitions of the future, particularly premonitions of disaster. One reasonable interpretation of such premonitions is that they are the result of some extraordinary human power to divine the future in times of crisis, some psychic power we would not expect man to have as a result of the random process of evolution. Another reasonable interpretation is that such premonitions come from some benevolent external source wishing to warn us. Because neither interpretation is very consistent with the idea that we live in a purposeless universe of blind chance, verified premonitions can be considered a hint of cosmic purpose.

40. Paranormal Healing and Paranormal Diagnostics

I would not recommend that the average person go to a psychic healer in preference to going to doctor. There are probably quite a few frauds passing themselves off as psychic healers. However, there are some well-documented cases of people who apparently had astonishing abilities to heal illness or diagnose illness in a paranormal manner.

One early example of a psychic diagnostician was Andrew Jackson Davis, who would go into trances and diagnose illnesses and prescribe medical treatments. Davis was highly successful in this activity, despite having had only five months of education and almost no book learning. Around age 21 the still untutored Davis produced an 800-page book *The Principles of Nature*, filled with astonishing erudition and deep philosophical insight,

including a description of the universe's origin similar to the Big Bang theory. Davis claimed to be receiving information from a spirit realm.

A later example (known to more Americans) is the case of Edgar Cayce. For many years Cayce would go into a trance and give a diagnosis of people he had only just met or knew only from some letter the person had written. Time and time again, his statements proved to be medically accurate.

Then there was the strange case of George William Chapman. In 1951 Chapman claimed that he had a "spirit control" of William Lang, a physician who died in 1932. Chapman claimed that Lang would now be doing his medical work through Chapman. Chapman then went on to have an enviable record as a healer. He would reportedly be able to immediately know what was wrong with a new patient, before the patient had said a word. Some who had known William Lang claimed that when Chapman was channeling Lang, the result would be very much as if William Lang was speaking.

Another similar case was the far more astonishing case of Jose Pedro de Freitas, known as Arigo. Arigo had no medical training, but claimed to be channeling a physician named Dr. Fritz who had died during World War I. For many years Arigo saw as many as 300 patients a day, and was reportedly able to accomplish an amazing record of healing. He supposedly performed surgeries without anesthesia, using some mysterious psychic technique. Even without anesthesia, his patients would report little or no pain, and little bleeding. Arigo could also reportedly diagnose patients correctly almost instantaneously. When asked how he did it, Arigo would say that it was easy, because he just listened to Dr. Fritz.

Then there are inexplicable spontaneous remissions of disease. In 1993 O'Regan and Hirshberg did a survey that found 1385 cases of spontaneous remission. Here is one summary of their study:

Of these cases, 1051 referred to spontaneous remission of cancer and 334 to other diseases. They were all instances where patients were diagnosed with X-rays, biopsies, and so on, and they either refused treatment, no treatment was available, or they were treated by methods that were available but were known to be insufficient for a cure. And all the patients fully recovered.

The cases mentioned here are extraordinary, but there is one type of paranormal healing that is so common that we should hesitate to even call it paranormal. This is what is called the placebo effect, the simple fact that

people often get better whenever they believe that a particular thing will make them better (regardless of whether that thing has any medical effectiveness that scientists understand). There is an enormous amount of evidence for the placebo effect. One example is that whenever pharmaceutical companies test a new drug, they test it against a placebo (which might be something like a sugar pill that looks just like the drug being tested). What these companies find again and again is that people who are given the placebo will see results almost as good, as good, or sometimes even better than the people being given the drug being tested. You could fill up a large bookcase with the evidence for this that pharmaceutical companies have collected.

The many cases of supposedly miraculous cures at places such as Lourdes are often considered as just extreme examples of the placebo effect. A person may arrive at Lourdes convinced that a miracle cure will happen, and quite often such a healing seems to occur. It could be the result of some supernatural effect, or simply an extreme form of the placebo effect – the body yielding to the power of the mind.

Even if such alleged miracles are due to just the placebo effect, they are still relevant to the question of cosmic purpose. If the human mind has some astonishing ability to produce bodily cures on its own, this suggests that our minds or spirits have powers far beyond what they should have under the materialistic theory that consciousness is a mere by-product of brain activity. The items mentioned here hint at the idea of a human soul, a human spirit with remarkable powers that cannot be plausibly accounted for in a purposeless universe of blind chance, but which make sense within the context of a purposeful universe in which the soul survives death.

41. Unexpected Examples of Large-Scale Positional and Kinetic Non-Randomness

Modern astrophysics has provided three cases in which astronomical objects seem to either move in a highly non-random way, or be arranged in a highly non-random way. Each of these cases raises doubt about the idea that the universe is the product of blind chance.

The first case involves spiral galaxy spins. A large fraction of the galaxies in the universe are spiral galaxies, and spiral galaxies rotate, taking about 200 million years to make a rotation. The rotation of a spiral galaxy is rather like a rotation of a pinwheel or a rotation of the turbine blades of a windmill, in the sense that it can spin in either one direction or the opposite direction. The two directions are called left-handed spins and right-handed spins. Scientists originally expected the number of galaxies with left-handed spins to be equal to the number of galaxies with right-

handed spins.

Physicist Michael Longo and his helpers studied more than 15,000 galaxies to determine which direction they were spinning (something that seems like the most tedious assignment imaginable). The end result was very surprising. Instead of finding that spiral galaxies spin in one direction 50% of the time and the other direction 50% of the time, Longo found that in some parts of the sky galaxies prefer to spin one way or the other significantly more frequently. In some directions of the sky there is an almost exact balance between galaxies that are spinning in a "left-handed" way and galaxies spinning in the opposite, "right-handed" way. But in other directions of the sky, "left-handedness" can be preferred by as much as 7% over "right-handedness."

While it may seem small, such a 7% preference is really huge, when one considers the law of large numbers, which dictates that when you have very many trials (such as more than 1000) the deviation from the expected chance result should be very, very small. The law of large numbers dictates, for example, that if you flip a coin 10,000 times, there is only the tiniest chance that the number of "Heads" flips will be more than 51%.

It seems very hard to reconcile Longo's finding with the assumption of a random universe controlled by chance. So when Longo's results were announced, scientists took the convenient route of thinking: *we'll just ignore this, because after all, it's only one study.*

But then the next year scientist Lior Shamir produced a scientific paper presenting the results of a much larger analysis on spiral galaxy spins. Shamir analyzed 126,501 galaxies, and found that the effect reported by Longo is very real: spiral galaxies prefer to spin in a left-handed direction in a particular direction of the sky. The degree of preference is about the same reported by Longo, about 7%.

How could such a thing be happening by chance? There has been talk that a "rotation of the entire universe" might be an explanation, but the suitability of such an explanation is very questionable, and the idea of a rotating universe doesn't fit in with prevailing astrophysical theories.

Another rather similar anomaly is related to quasars. Quasars are very energetic astronomical objects associated with the cores of very distant galaxies. Quasars shoot out jets of gas in a particular direction. Scientists know of no reason why these jets of gas should not be pointing in random directions.

But surprisingly, what are called the polarization vectors of quasars tend to

be aligned in the same direction in particular regions of space. In one gigantic area of space, they may be aligned in one direction, and in another huge region of space, they may be aligned in some different direction. This is an unexplained cosmic anomaly that leaves astrophysicists scratching their heads in bewilderment. A recent analysis of these alignments calculated a probability of only 0.003% (about 1 chance in 33,000) that such alignments would randomly occur in a particular region.

Scientists have made 4 maps of these quasar polarization vectors. Scientists expected that such maps would look like a table on which was scattered a cup full of raisins, a random scattering. Instead the maps look rather like a table on to which someone tossed two fists full of chopsticks. On two of the maps one can even see the word “Hi” spelled out in gigantic “letters” spanning many millions of light years, a distance much greater than the length of our galaxy.

The third case of the three cases I referred to is that a scientific paper found an astonishingly strong tendency for the motions of opposite pairs of dwarf galaxies to be anti-correlated. That phrase is quite a mouthful, so let me give a visual which explains it.

In the picture below, we see a galaxy with two much smaller dwarf galaxies next to it. (The picture is a composite image not intended to represent some particular galaxy.) The dwarf galaxies rotate around the larger galaxy. But they rotate in opposite directions, as shown by the red arrows. This is what is meant by an anti-correlated motion.

The Nature paper (by Neil Ibata, Geraint Lewis and others) first checked a huge computer model of the universe to see whether we should expect to see any difference between these two things:

1. The number of dwarf galaxy pairs on opposite sides of a galaxy which have their rotation motions anti-correlated with each other.
2. The number of dwarf galaxy pairs on opposite sides of a galaxy which have their rotation motions correlated with each other.

The model predicted that there should be no difference between these two. But the observations gave a dramatically different picture. The study found that for every dwarf galaxy pair that had a correlated motion, there were between 2 and 4 that had an anti-correlated motion.

“We were surprised to find that a large proportion of pairs of satellite galaxies have oppositely directed velocities if they are situated on opposite sides of their giant galaxy hosts," said Neil Ibata, one of the paper's authors. "Everywhere we looked we saw this strangely coherent coordinated motion of dwarf galaxies. From this we can extrapolate that these circular planes of dancing dwarfs are universal, seen in about 50 percent of galaxies," said Professor Geraint Lewis. "This is a big problem that contradicts our standard cosmological models. It challenges our understanding of how the universe works including the nature of dark matter."

None of these three cases seem to involve any necessity. We know of no reason why these cases of large-scale non-randomness have to be non-random in order for things to work out well in the universe. But we can reasonably interpret each of these three cases as being a kind of cosmic sign, a kind of cosmic “shout out.” It is as if some mighty power in control of the universe was telling us in three different ways: “Chance is not in charge out here; I am in charge.” So these three cases together can reasonably be interpreted as a hint of cosmic purpose.

42. The Existence of Man's Higher Mental Faculties

Now let's look at another hint of cosmic purpose: the very fact that there exists minds such as the mind that is reading this sentence.

Now a Darwinist may say that such a thing is no sign of cosmic purpose, because it can all be explained by blind evolution. But can we explain all of the characteristics of the human mind by simply listing evolution as their cause?

The main principle behind Darwinian evolution is the principle that organisms tend to gradually evolve characteristics that give them a greater survival value in their environment. This principle allows us to explain many facets of humanity, particularly everything underneath our necks. We have arms and hands because we are descended from species that used to live in trees, and needed arms and hands to swing from branch to branch. We have legs capable of running fast, because we needed those to escape from predators. We have good vision because we needed that to find food and spot predators. All of these things can be explained through the principle of natural selection – survival of the fittest. Most characteristics of a species that make the individual members of a species more likely to survive (until they reproduce) can be explained by referring to natural selection and evolution.

However, there are some important aspects of human nature that seem to be difficult or impossible to adequately explain by using an explanation of evolution and natural selection. Humans have inner selves and personalities. Humans are great at language, and at formulating very abstract ideas. Humans are capable of wonder, joy, love, guilt, compassion, imagination, and spirituality. Humans can create art and literature, ponder their own deaths, wonder about the meaning of life and the nature of the universe, create and follow moral codes, and consider philosophical matters.

It is hard to explain any of this by evoking evolution or natural selection, because most of it has no survival value, from an evolutionary standpoint of making an organism more likely to survive until it reproduces. 50,000 years ago a human who felt wonder by looking at a sunset was not any more likely to survive than a human who did not (in fact, the sunset-appreciating human was actually less likely to survive, as he might let down his guard and be attacked by a predator while he was enjoying the sunset). We can't explain the origin of man's talents at art, philosophy, mathematics and literature by imagining that such talents evolved because people who had them were more likely to survive until reproduction.

Imagine you're a cave man 50,000 years ago. Life is pretty simple: find food, don't freeze to death, and don't get eaten by a predator. People at that time had no need for language, math, art, literature, philosophy, or inner thoughts. Grunts and hand signals would have worked just fine to alert your fellow cave man when you see a predator. So how did man get all of his higher faculties that have allowed him to create art, novels, science, philosophy, and government?

The typical evolutionary explanation involves random mutations and random variance plus survival of the fittest. For example, imagine a

population of early humans. Because of random mutations and random variance, some of the population would by chance have longer, stronger legs. Then more of that population would survive because those organisms could run faster to escape predators. That works fine for explaining the evolution of certain physical characteristics of the human body, and also some parts of the brain involving human perception.

But the same type of explanation would seem to be impotent and useless for explaining some higher faculties of mankind – simply because we would not expect that any random mutations or random variance would ever cause some early humans to have a slightly higher amount of such faculties. It would not seem that random variance or random mutations could cause a certain number of early humans to be a little more capable of love, guilt, language, mathematics, self-introspection, philosophy, spirituality, wonder, or advanced moral concepts. It almost seems to require a kind of quantum jump to go from an animal mind to a mind capable of such things. Can we really imagine that a random mutation or a random variance would cause an organism to have a little bit of spirituality when its parents had no spirituality?

In fact, Darwinism and natural selection simply are not adequate to explain the higher characteristics of the human mind. The very existence of such characteristics is an indication that something much more than just evolution was involved in their origin. There must be some more elaborate explanation. One possibility is that the universe has been kind of deliberately programmed to produce intelligent beings. The full details of such programming might include evolution, but also something a lot more.

As there is no reason to think that mere blind evolution would actually produce beings with all the higher characteristics of the human mind, the very existence of beings such as us is a hint of cosmic purpose.

43. The Fine-tuning of the Higgs

According to the Standard Model of physics, there is an energy field that exists everywhere in the universe. This field is called the Higgs field. Scientists say that this Higgs field “gives mass” to other particles such as the particles that make up the atom: the proton, the electron, and the neutron. The Higgs field uses a particle called the Higgs boson to interact with other particles. The effect by which other particles gain mass through the Higgs field is called the Higgs effect. Although in the 1990's these ideas were not well-confirmed, around 2012 scientists finally discovered the Higgs boson using very expensive and complicated particle accelerators.

Scientists say that if the Higgs field had zero energy, the particles that make up atoms would have no mass. In that case there would be no atoms at all. Physicist Matt Strassler once specified what things would be like if the Higgs field had zero energy, and he painted a portrait of a universe completely different from ours, one in which life would be impossible.

There is a great mystery involving the Higgs boson, a mystery that scientists have fretted over for decades. This is the mystery of why the Higgs boson has such a small mass. The mass of the Higgs boson is known to be about 126 GeV, which is roughly 100 times the mass of a proton. But scientists have strong reasons for believing that the Higgs boson should have a mass many, many times greater than its actual mass. This discrepancy is known as the "Higgs naturalness problem" or the "Higgs fine-tuning problem," and has been widely discussed by physicists for decades.

Here is how one particle physicist states the problem (he uses the term fermion/boson sum to refer to the mass of all fermion particles divided by the mass of all boson particles, a number that no one expects to coincidentally be a very small number):

The mass of the Higgs is equal to the theoretical mass plus a monstrously large number multiplied by the fermion/boson sum. Unless the fermion/boson sum is practically zero, the observed mass of the Higgs boson should be huge. The only way to escape this conclusion is to somehow balance the fermion/boson sum to be exceedingly small. And to have the balance so perfect is utterly unnatural, as if we added up all the monthly paychecks of everyone in the United States and subtracted their monthly bills and those two huge numbers canceled out neatly.

What the physicist is saying here is that it is as if the Higgs boson has a very small mass because of some incredibly improbable coincidence, a case of two sums (consisting of many different parts) coincidentally canceling each other out. It's the kind of coincidence you might have if you added up the telephone numbers of all your male friends and male relatives and then subtracted from them the phone numbers of all your female friends and female relatives, and then ended up with some very small number such as 2 or 6.

Physicists say that the "natural" mass of the Higgs boson should be something like the Planck mass, which physicists sometimes refer as the one "dimensionless" mass suggested by physics. The Planck mass is equal to 2.435×10^{18} GeV. That is a mass about 10,000,000,000,000,000 times larger than the mass of the Higgs boson. Scientists say that in order for

you to end up with a Higgs boson as small as the one we have, through the type of "coincidental cancellations" described above, you would need to have a coincidence with a probability of about 1 in 10,000,000,000,000,000, the difference between the Higgs mass and the Planck mass.

In an attempt to explain away this troubling case of fine-tuning, many physicists have invested a great deal of time in developing a theory called supersymmetry. This theory could supposedly explain why the Higgs boson has such a small mass. But there are two huge problems with supersymmetry. The first problem is that it makes predictions that certain particles will be found by large particle colliders such as the Large Hadron Collider. But such predictions have not been confirmed. Some scientists say that supersymmetry is "on life-support" because scientists haven't found the particles supersymmetry predicts, even though they should have found them if the supersymmetry theory is true.

Another problem is that the supersymmetry theory really just "robs Peter to pay Paul" to explain away the low mass of the Higgs boson. This is because the supersymmetry theory removes a "gigantically coincidental" low mass of the Higgs boson through the trick of imagining a whole series of other coincidences – coincidences that each type of particle coincidentally has a "super-partner" with the same mass.

So thus far scientists have failed to explain away the fine-tuning of the Higgs boson. We are left with a "lucky coincidence" with a probability of something like 1 in 10,000,000,000,000,000, a coincidence crucial to our existence. This is a very strong hint of cosmic purpose. It is just as if the Higgs boson has been deliberately fine-tuned to have a very low mass, so that life can exist in our universe.

44. The Massive Amount of Computation Seemingly Necessary for the Universe's Operations

There is a very interesting question to consider that has not received enough attention from scientists and philosophers. The question is: what, if any, are the computation requirements of nature? By this I mean: is it necessary that nature does some type of computation? If so, how much computation does nature need to do, and what elements of computation would nature need to satisfy such requirements?

There are reasons for thinking that nature actually requires a fantastic amount of computation to perform its operations. One reason for thinking that is gravitation. It seems that for nature to handle gravitation as we understand it, insanely high amounts of computation are required.

This may seem surprising to someone familiar with the famous formula for gravitation, which is quite a simple formula. The formula is shown below:

$$F = \frac{G m_1 m_2}{d^2}$$

In this formula, F is the gravitational force, G is the gravitational constant, m1 is the first mass, m2 is the second mass, and d is the distance between the masses.

Now looking at this formula, you may think: it looks like nature has to do a little calculation to compute gravity, but it's not much, so we can just ignore it. But the fact is that the formula above is perhaps the greatest oversimplification in the history of science. The reason is that the formula is not the formula for computing the total gravitational forces acting on any single object in the universe. Instead, it is merely the formula for computing the gravitational force acting between one particle in the universe and any other particle in the universe.

To actually fully compute the gravitational forces acting on any one object or particle in the universe, we must do an almost infinitely more expensive calculation-- a calculation that must involve the mass of all other objects in the universe. This is because gravitation is an inverse square law with an infinite range. Every single massive object in the universe is exerting a gravitational force on you, and every other massive object.

I may note the very interesting fact that not one physicist in the history of science has ever done one billionth of the work needed to completely compute the complete gravitational forces attacking on any single particle or object.

To illustrate the computation requirement to calculate the gravitational forces acting on a single particle, I can write a little function in the C# programming language:

```
void ComputeGravitationalForcesOnParticle
 (particle oParticleX)
{
  foreach (particle oParticleY in Universe)
   {
```

```
    double dForce = 0.0;
    double dTemp = 0.0;
    dTemp = (oParticleX.Mass * oParticleY.Mass) /
    ComputeDistanceBetweenParticles(oParticleX, oParticleY);
    dForce = GravitationalConstant * dTemp;
    ApplyForce(dForce, oParticleX);
   }
}
```

This is a function that takes one particular particle in the universe as an input, and computes the complete gravitational forces acting on that particle. It requires a loop, but the loop must run for a total of *Z* iterations or passes, where *Z* is the total number of particles in the universe. So the loop must run for approximately 10^{80} iterations (which is about the total number of particles in the observable universe). This means the loop must run about ten thousand billion trillion quadrillion quintillion sextillion times.

Now that's quite a bit of computation required. But for nature to do all the work needed to compute the gravitational forces on *all particles in the universe* during any given instant, it needs to do vastly more work than to just do the equivalent of running this function that is so expensive from a computational standpoint. Nature has to do the equivalent of a double loop, in which this loop is just the inner loop. To represent this in the C# language, we would need code something like this:

```
foreach (particle oParticleX in Universe)
{
 foreach (particle oParticleY in Universe)
 {
    double dForce = 0.0;
    double dTemp = 0.0;
    dTemp = (oParticleX.Mass * oParticleY.Mass) /
    ComputeDistanceBetweenParticles(oParticleX, oParticleY);
    dForce = GravitationalConstant * dTemp;
    ApplyForce(dForce, oParticleX);
  }
}
```

This is what is called a doubly nested loop, and programers know that doubly nested loops often become incredibly expensive from a computational standpoint. In this case the outer part of the loop must be traversed about 10^{80} times, which is ten thousand billion trillion quadrillion quintillion sextillion iterations. But during each such iteration

or pass the inner loop must also be run 10^{80} times. So the total number of times the inner part of the loop must be run is 10^{160} which is ten thousand billion trillion quadrillion quintillion sextillion times greater than the total number of particles in the observable universe. This immensely expensive calculation must apparently be done not just once a second, but multiple times a second.

In any case in which you are calculating, say, once every second rather than a tiny fraction of a second, the calculation would have to be much more complicated, as it would have to take into account the relative motion between objects.

This makes it pretty clear that nature does indeed need to compute in order for gravitation to occur. It would seem that the computational requirements of gravitation are insanely high.
If we were to look at the computation requirements of electromagnetism, we would find a very similar situation. To compute the electromagnetic forces working on particles, nature needs an amount of computation as great as it needs to compute gravitation.

When we look at other phenomena in nature such as particle collisions, quantum entanglement and wave functions, we find the same type of thing: cases in which nature can only behave the way it does if it has some vast computing functionality. There are quite a few reasons for thinking that nature needs a vast computing functionality (including both a database component and a computing component) in order to get its work done in the way that modern physics describes the universe's operations.

It is very easily to lazily ignore the issue by just kind of thinking that somehow nature magically gets its work done. But when we start thinking about nature's computation requirements, we begin to realize that the universe is apparently something that requires vast computing functionality. In order for you to have any advanced computing functionality, you need three essential parts: (1) something like programming; (2) something like a computation engine to process data; (3) something like a database engine to store data. We don't know any details about how such things are implemented within nature, but we can and should infer that they exist.

The fact that nature apparently has all of these things is a strong hint of cosmic purpose. We would not expect for any of these things to exist in a random universe ruled by blind chance. The conclusion that nature needs to have some kind of programming suggests that some type of intelligence once acted as a programmer of nature's software.

For a much more detailed discussion of the reasoning given here, with many other examples and a much fuller discussion of the theoretical issues, see the articles on the web site below:

www.programmedcosmos.blogspot.com

45. Experimental Evidence for Precognition and Mind Over Matter Effects

In 2011 Daryl Bem published the paper “Feeling the Future” in a peer-reviewed scientific journal. The paper reported the results of controlled experiments which seemed to suggest the existence of precognition, the ability of humans to detect the future in a paranormal way. There were voices of outrage that an Ivy League university could have been involved with such a finding, which was denounced as pseudoscience. In the next months skeptics trumpeted one or two unsuccessful attempts to replicate the experiments.

But in 2014, however, Bem and others published a meta-analysis looking at 90 different experiments on precognition done in 33 laboratories. They found that Bem's sensational experiments had been well replicated. It seems that there are two ways of doing Bem's experiments, a “fast protocol” and a “slow protocol.” It seems that when you use the fast protocol, trying things just as Bem did, the effect does reproduce well. The paper found that to explain the results as a coincidence, one would have to believe in a coincidence with a chance of about 1 in 10 billion.

Bem's original “Feeling the Future” study was not at all a unique bolt-from-the-blue, but merely something in the same vein as quite a few previous studies indicating that something like precognition can occur. One type of experiment involving precognition is called a forced choice experiment. A person is asked to guess which of a small number of possibilities will occur next (such as which card will be selected from a shuffled deck, or which number will appear the next time a dice rolls). A 1989 meta-analysis published in the Journal of Parapsychology reviewed forced-choice precognition experiments done between 1935 and 1987 by 62 investigators involving 309 studies, involving two million individual trials and 50,000 subjects. The meta-analysis showed a significant effect, with a by-chance likelihood of only 6 chances in ten trillion trillion (.000000000000000000000006). This is overwhelming experimental evidence for precognition.

A different type of precognition experiment is called a free-response experiment. In such an experiment, a person is free to choose any answer

he wants. Free-response experiments were conducted by the Stanford Research Institute between 1973 to 1988 (with results that by chance had a likelihood of 3 chances in a billion) and by the Science Applications International Corporation (SAIC) from 1988 to 1995 (with results that had a chance likelihood of 6 chances in 10 million).

Gary Schwartz PhD did a remarkable precognition experiment with Christopher Robinson, who claims an extraordinary ability to have dreams about the future. In the experiments (performed under rigorous controlled conditions over 10 days in Arizona) Robinson wrote down the contents of his dreams each morning. His dreams were kept hidden from Schwartz, who drove him around to a different location each day, using a random selection from a list of locations unknown to Robinson. On each day there was a close match between the actual locations and the daily dreams, recorded before Robinson had any idea of where he would be going that day.

So the experimental evidence for precognition is strong. When they hear anecdotal reports of premonitions that turn out true, skeptics say, "But there is no laboratory evidence." The results above prove that just isn't true. There is abundant laboratory evidence. When they are presented with the laboratory evidence, skeptics typically make a claim such as the claim that the results are not repeatable. This claim is also not true. Successful experimental results have been produced again and again, and those are repeatable results. When cornered with evidence that very strong experimental results have been repeatedly produced in favor of human precognition, a skeptic will typically resort to a variety of specious technical and procedural objections of a type that are never made against other scientific experiments that do not involve paranormal phenomena.

There is also some laboratory experimental evidence for mind over matter effects, the ability of the human mind to alter physical systems. Perhaps the best example is the long-running Global Consciousness Project that was originally associated with Princeton University. The project has been running since 1998, and consists of a worldwide network of computerized random number generators. Output from these random number generators are compared with world events, to see whether there is any deviation from randomness when any notable world event occurs. For more than 15 years, the project has detected multiple times per year when the output of the random number generators deviated from what would be expected from chance, with the deviations always coming around the time of major global events. According to Dean Radin, PhD, "The overall results show an unambiguous deviation from chance, with odds against chance of 284 billion to 1." It is as if the collective consciousness of mankind has some mysterious ability to exert a mind-over-matter effect.

Radin has done experiments looking for subtle mind-over-matter effects, using scientific tests such as double-slit experiments and using scientific equipment such as interferometers. He summarizes the results as follows:

When the results of the meditators' sessions in the Michelson interferometry study are combined with the meditators' data in the double-slit studies, the overall odds against chance accumulate to 3.7 billion to 1. The bottom line – mind and matter interact.

But is this strong evidence for precognition and mind-over-matter effects a hint of cosmic purpose? Yes it is – not a very strong hint, but at least a subtle hint. Evidence for precognition and psychokinesis suggest that human beings have lurking within them an utterly extraordinary type of power of a type that no computer will ever be able to match. Such evidence suggests the idea of a higher human soul that cannot be accounted for under any materialist theory that consciousness is a mere by-product of brain activity. A universe that produces such a higher human soul is not at all likely to be the "blind chance" universe of materialists, but a universe of cosmic purpose.

46. The Neutron's Improbable Charge Neutrality

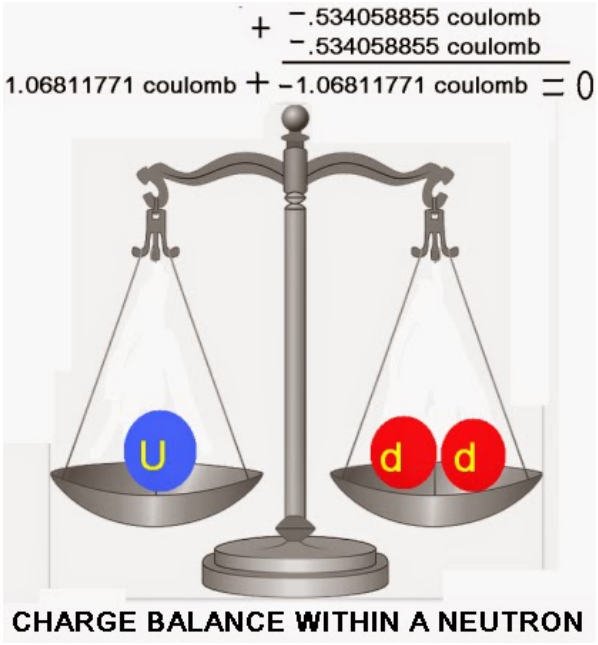
Neutrons are one of the 3 types of particles that make up an atom, and one of the two types of particles that make up the nucleus of an atom. Because they produce the strong nuclear force that works as a kind of "glue force" that holds the nucleus of an atom together, neutrons are a crucial ingredient of atoms such as the oxygen atom and the carbon atom. Without neutrons, hydrogen atoms could exist, but oxygen and carbon atoms could not exist.

Having no involvement with electricity, neutrons have a reputation as being rather boring particles. But there is one incredibly strange and improbable thing about the neutron which no scientist has been able to explain in a way that removes astonishment. This is simply the fact that neutrons are electrically neutral, having no net electrical charge at all. Let me explain why this is much, much less likely than you winning 100 million dollars in the Powerball lottery tomorrow.

If a neutron were not composed of any smaller charged particles, then there would be nothing particularly improbable about the fact that neutrons are electrically neutral. But according to the Standard Model of Physics, the neutron is composed of three smaller charged particles. The Standard Model says that a neutron is composed of one Up quark and two Down quarks.

According to the Standard Model of Physics, the Up quark has a positive electric charge equal to two thirds of the charge of a proton. The Down quark has a negative electric charge equal to one third the charge of the proton. The amount of positive charge in the neutron therefore exactly balances the amount of negative charge in the neutron, leaving the neutron with a net electric charge of 0.

I can illustrate this balance by the following visual. The scale shows the positive charge of the neutron on the left, and the negative charge of the neutron on the right. The two balance each other precisely (as represented by the balanced scale).



CHARGE BALANCE WITHIN A NEUTRON

How precise is this balance? In the above visual I only use 9 decimal places to avoid making the numbers too small to read. But the actual balance is to at least twenty decimal places. The exact figure given in a scientific paper is that the neutron charge is less than $1.8 \text{ X } 10^{-21}$ of an electron charge. For this to be true, the positive charge within a neutron must differ from the negative charge within the neutron by less than than 1 part in 100,000,000,000,000,000,000.

It would seem that the chance of this coincidentally happening is incredibly low. To give an analogy, imagine you make a great deal of money as a Wall Street investment banker, and your spouse is always losing money at the casino. At the end of the year, you calculate your net

income, and find that even though you've made millions this year, when you subtract your spouse's gambling losses, you find that you net income is exactly 0 dollars and 0 cents, because your spouse's gambling losses coincidentally exactly canceled out your income, to the penny.

But isn't there some way to avoid believing that we have been blessed by a coincidence in this matter, a coincidence with a probability of less than 1 in 100,000,000,000,000,000,000? We might avoid the coincidence if we could say that an Up quark is made up of exactly two Down quarks – except that wouldn't really work, because the charge of the Down quark is negative and the charge of the Up quark is positive. Also, scientists do not actually think that an Up quark is made up of two Down quarks.

We might also avoid the coincidence if we had some good basis in believing in a required quantization of electric charge – a reason why electric charge must necessarily occur in a multiple of one third of the proton charge or one third of the electron charge. But no such reason is known. In fact, the scientific paper I just cited says at its beginning, "The Standard Model with three generations does not have electric charge quantization."

One may ask whether this coincidence is the same coincidence as the earlier "hint of cosmic purpose" that the proton charge exactly equals the electron charge (the only difference being that the proton charge is positive and the electron charge is negative). No, that is a separate coincidence, but one equally improbable, also requiring something with a chance smaller than 1 in 1,000,000,000,000,000,000. Experiments have verified that the proton charge and the electron charge differ by less than 1 part in 1,000,000,000,000,000,000 (not considering the signs).

The Standard Model gives us three stable charged particles: the Up quark with a charge of $2/3e$, the Down quark with a charge of $-1/3e$, and the electron with a charge of $-1e$ (where e is the proton charge of 1.60217657 coulomb). Protons are made of 2 Up quarks and one Down quark, and neutrons are made of 2 Down quarks and one Up quark. We have two separate coincidences here: (1) the fact that the charge of the Up quark is precisely twice the charge of the Down quark (not considering the sign), which is the "hint of cosmic purpose" being discussed here; and (2) the fact that 2 Up quarks and a Down quark (the constituents of a proton) have a total charge that adds up to a number exactly equal to the charge of the electron (not considering the sign).

Both of these coincidences have a likelihood of occurring (in a "blind chance" purposeless universe) of less than 1,000,000,000,000,000,000, but both occurred. Either coincidence is a strong sign of cosmic purpose, that

the universe was deliberately designed to allow for the existence of intelligent life. If either coincidence had not occurred, we could not have the oxygen atoms and carbon atoms that are needed for life to exist.

47. Paranormal Electromagnetic Signals

Strangely enough, there exists significant evidence suggesting that various types of electromagnetic signals can be transmitted as a result of contact with some spirit world or dimension or plane to which humans may go when they die. One type of evidence is what is called EVP, which stands for electronic voice phenomena. EVP signals are brief unexplained voices that appear in audio recordings. One of the first people to record EVP voices was Friedrich Jürgenson , a film producer who found unexplained voices while recording bird songs. Later Konstantins Raudive claimed to have recorded many thousands of audio recordings containing unexplained voices. Nowadays there are television series such as *Ghost Adventures* which claim to pick up voices from the dead, and many EVP recordings can be found on www.youtube.com.

The validity of EVP is a matter of debate. The content of EVP recordings are typically very short messages, often with a garbled sound. Such messages often can be interpreted in different ways – for example, a message that one person interprets as "Mary left" might seem to mean "Merry laugh" to someone else. Some EVP researchers claim to get unexplained audio messages in direct response to their questions.

Another example of paranormal electromagnetic signals are the radio signals picked up by Marcello Bacci. For many years Bacci picked up unexplained voices by using a large old-fashioned radio set, and tuning it to a frequency that normally gets only static or "white noise." These paranormal voices have been frequently observed in the presence of dozens of observers. The voices respond to questions or remarks made by people witnessing Bacci's radio sessions. Perhaps it is all a big fraud, but if so it would have to be an extremely clever one, as Bacci has often let investigators examine his radio equipment before using it for a session witnessed by many others.

Another case of paranormal electromagnetic signals has been reported by Gary Schwartz, PhD. Schwartz produced a paper at the 2014 Parapsychological Association annual meeting, a paper entitled "Anomalous and Replicated High Amplitude Photon Bursts Associated with Specific Hypothesized Spirits." Below is part of the abstract of the paper:

Previous research in the Laboratory for Advances in Consciousness and

Health at the University of Arizona has observed replicated effects of hypothesized spirit presence on measures of photon activity using a silicon photomultiplier (2010) system and Princeton low light cooled CCD camera system (2011). In addition to obtaining significant main effects of hypothesized spirit presence versus matched baseline control trials, we have observed replicated individual difference effects between hypothesized spirits (for ease of communication, from herein hypothesized spirits will simply be called spirits). In Schwartz (2010) using a silicon photomultiplier, two spirits (called S2 and S5) produced reliably larger magnitude effects on photon bursts compared to matched baseline control trials than two other spirits (called S1 and S3). In a follow up series of experiments using the silicon photomultiplier focusing on S5 (Schwartz, submitted for publication), replicable large magnitude effects on photon bursts were again observed.

Basically Schwartz had some fancy scientific equipment that he was using under controlled conditions. He claims to have received unexplained light signals that seem to be produced by immaterial spirits.

This is quite an extraordinary claim, but it should come as no surprise to anyone who has read up on the Scole experiments conducted during the 1990's. These were a long series of seances, carried out over the course of years. There were quite a few witnesses at these seances who claimed to observe paranormal events, including three researchers from the British Society for Psychical Research. One of the main occurrences were spectacular unexplained lights which moved around very frequently in a way that would be very hard to explain naturally or by some type of trickery. Some of the witnesses' testimony can be found on www.youtube.com by searching for “Scole experiments.”

There were two particularly remarkable electromagnetic phenomena recorded by the Scole experiment investigators. They found symbolic photographic images that inexplicably appeared on unopened film containers that they took directly from the seances to a developing lab. The main researcher Montague Keen also said that the researchers had placed a blank tape in a cassette recorder which had no microphone. Recordings then inexplicably appeared on the tape, including a particular piece of music that was one of Keen's favorites.

A lengthy report was written up for the Society of Psychical Research, a summary of which can be read at the URL below:

http://www.scientificexploration.org/journal/jse_15_2_keen.pdf

Paranormal electromagnetic signals are a hint of cosmic purpose, because

they suggest the existence of some type of afterlife which would only exist in a purposeful universe.

48. Quantum Entanglement

One of nature's strangest phenomena is called quantum entanglement. An example of quantum entanglement is shown in the illustration here. Particle C is a particle that decays into two daughter particles, A and B. Until someone measures the spin on either of these two particles, the spin of each of the daughter particles is indeterminate, which in quantum mechanics is a kind of fuzzy “not assigned yet” state (it might also be conceived as a combination of both possible spin states of Up and Down). It's rather like the same idea that one sees in a probability cloud diagram of an atom, showing an electron orbital, where rather than saying that the electron has an exact position we say that the electron's position is “spread out” throughout the probability cloud. Now, as soon as we measure the spin of either particle A or particle B, the spin becomes actualized or determined (one might may *assigned*, speaking as a programmer), and the other daughter particle then has its previously indeterminate spin become actualized, to a value that is the opposite of the spin value of the first particle. This effect has been found to not be limited by the speed of light, and seems to occur instantaneously.

Quantum entanglement can occur between more than two particles. One particle can be quantum-entangled with many other particles. This can set up a kind of domino effect, in which changing one particle can lead to a change in many other particles. But to imagine how strange quantum entanglement can be, imagine domino blocks that are separated by significant distances. Imagine if knocking over one domino causes many other dominoes to fall, even though they are not near each other. That's how weird quantum entanglement is.

When Einstein first heard about quantum entanglement, he scorned it as “spooky action at a distance.” This is because quantum entanglement seems to act in a kind of magical way. How could changing or observing one particle cause many other particles to instantly change, even if they are millions of miles away? But scientists have confirmed that quantum entanglement really exists.

Quantum entanglement is not some rare effect. Quantum entanglement is occurring all over the universe. In fact, scientists say that quantum entanglement may play a crucial role in some things that are necessary for intelligent life. One such thing is photosynthesis, the process by which

plants convert sunlight into energy. According to an article on the Science Daily web site (summarizing research by scientist Graham Fleming and others), “Quantum entanglement is thought to be a critical factor behind the ability of green plants and certain bacteria, through photosynthesis, to transfer energy from sunlight and initiate its conversion into chemical energy with near 100-percent efficiency.” Photosynthesis is crucial for plants, which are a vital lower part of the food chain that leads up to animals and humans.

Quantum entanglement may also be crucial in holding together DNA. The DNA molecule is one of nature's greatest wonders: a single molecule of a very long length, which has a spiral staircase structure. Summarizing research done by Elisabeth Rieper at the National University of Singapore, the Technology Review web site says, “Now a group of physicists say that the weird laws of quantum mechanics may be more important for life than biologists could ever have imagined. Their new idea is that DNA is held together by quantum entanglement.”

Some even think that quantum entanglement is crucial for consciousness, although we don't understand how consciousness arises from unconscious matter. Quantum entanglement seems to be so mysterious and important that a book written about the phenomenon was entitled “The God Effect.”

There are two ways of looking at quantum entanglement. One way is to regard it is as just mysterious magic or a miracle, and think no more about it. But another way to look at it is to ask: what kind of infrastructure would nature need in order to implement quantum entanglement? It seems that in order for it to occur that changing one particle can change one or more distant particles, nature needs to have something like a kind of database engine as part of some hidden infrastructure. It seems that nature needs to have some kind of database to keep track of which remote particles are quantum-entangled with a particular particle. How else could nature know which scattered particles are linked in a case of quantum entanglement?

But if such a database (or something like that) is needed, it has profound implications. It implies that the universe has some type of information infrastructure which we would only expect it to have if it is the result of deliberate design. Quantum entanglement is therefore yet another hint of cosmic purpose.

49. Cosmic Uniformity

If the universe were a random product of blind chance, we might expect to see major variations in its physical characteristics – differences that could be observed by looking in opposite directions of the sky. But no such

variations can be seen.

Scientists can look for physical variations over time and space by pointing different types of telescopes in opposite directions of the sky. Because of the speed of light (which travels only one light-year in a year), the farther away astronomers look, the more they are looking back in time. Since the universe began about 13 billion years ago, we can't see farther away than about 13 billion light-years when looking in any direction. Such a limit defines a region of space know as the observable universe. The observable universe is rather like a sphere that has a radius of 13 billion light-years. Our planet can be considered at the center of such a sphere, but only because the sphere defines the limits of our observations.

Scientists check for the uniformity of the universe by pointing a telescope in one direction of the sky, making observations, and comparing such observations with observations made when telescopes pointed in an opposite direction of the sky. This allows them to compare one end of the observable universe to an opposite end of the observable universe.

Such comparisons reveal an astounding uniformity. The cosmic background radiation that pervades the universe is uniform to within 1 part in 100,000. Scientists see no recognizable differences in cosmic structure when they look at opposite ends of the universe, studying parts of space that are separated by tens of billions of light years. Scientists have also determined that some of the physical constants of the universe are highly uniform over billions of light-years of space and billions of years of time.

One recent study involving quasars indicated that a fundamental constant of nature (the fine structure constant) varies by less than 1 part in a million over the past 10 billion years. Similar studies have indicated that the gravitational constant has not varied.

So our universe looks nothing like some random hodgepodge of matter and energy, some accidental conglomeration of physical situations. The universe does not have one set one of characteristics in one direction, and much different characteristics in some other direction. Instead, it as if the entire observable universe was made using the same blueprint. That doesn't prove that the universe was designed. But the universe's very great uniformity provides a hint that it was designed, and is therefore a hint of cosmic purpose.

50. “Peak in Darien” Experiences

Bruce Greyson PhD is one of the leading researchers on near-death experiences. Researchers on this topic have long used a scale introduced

by Greyson (called the Greyson Scale) as a way of measuring how closely a particular experience matches a typical or archetypal near-death experience.

The term “Peak in Darien” experiences is a term used by Greyson to describe cases in which a dying person or ailing person reports seeing one or more dead people, among which is some person whose death should have been unknown to the dying or ailing person, because he or she had not been told of such a fact or had not learned of such a fact. Greyson discussed quite a few such cases in his paper *Seeing Dead People Not Known to Have Died: “Peak in Darien” Experiences.*

Below are some of the cases listed by Greyson:

- A woman had a dying vision of four of her brothers, only three of whom were known by her to be dead. The fourth brother was in India, and was thought to be alive. Not long after she died, a letter arrived announcing the death of the fourth brother.
- There were two brothers who died of scarlet fever. The death of the first brother was kept secret from the second brother. Just before the second brother died, he claimed to see a vision of the first brother, calling to him.
- John Alkin Ogle was on his deathbed and saw a vision of his dead brother and a man named George Hanley. Ogle had not yet learned that Hanley had died ten days earlier.
- Two schoolmates named Jennie and Edith died from diphtheria. The death of Jennie was kept secret from Edith. Just before dying, Edith had a vision of Jennie, saying, “Oh Jennie, I am so glad you are here.”
- A woman on her deathbed saw a vision of her deceased father, who was next to her sister Vida. The woman did not know that her sister Vida had died three weeks earlier.
- While dying a woman named Eleanor called out the names of deceased loved ones she could see, and mentioned a cousin named Ruth, asking, “What's she doing here?” Ruth had unexpectedly died a short time earlier, and Eleanor had not been told.
- When Horace Wheatley went into a coma, he had a vision of a local government officer. Unknown to him, the government officer had recently died.
- A man had a near-death vision of two of his brothers, the second of whom had died two days earlier, unknown to the man. Only after his recovery did he learn about the death of the second brother.
- A 93-year-old woman dying of cancer had a vision of her sister calling him to join her. Unknown to the woman, the sister had died of cancer two days earlier.

- Two childhood friends named Ralph and Steve died at about the same time in different places. Just before he died, and just after Steve had died, Ralph had a vision of Steve.
- A dying man told his family that he had a vision of his dead grandmother, his dead mother, and his sister. He had not been told that his sister had recently died.
- A dying English woman reported hearing angelic voices, and then said she could see an old acquaintance of hers named Julia. The next day the newspaper announced Julia's death.
- On her deathbed a Mrs. Hicks had a vision of her son Eddie. Shortly after her death, the family learned that Eddie had died about the same time the mother had the vision.
- A woman had a near-death experience in which she saw a friend named Tom. Shortly thereafter, her husband learned that Tom had died in an auto accident.
- A native American woman was hit by a car. Asked by someone whether there was anything he could do, the dying woman instructed the man to tell her mother that she was "very happy because I am already with my dad." The man found the woman's mother, who told him that her husband (the father) had died of a heart attack one hour before the auto accident.
- After his mother died in an auto accident, a son dying from the same auto accident told a doctor, "Everything is all right now. Mommy and Peter are already waiting for me." The son died, and the doctor then learned that his brother Peter had died a few minutes earlier in another location.
- A man having a near-death experience reported that he saw his sister, who told him it was too soon for him to die. Later he told doctors that his sister must be dead. They assured him that she was alive. He told them to check, and they found the sister had indeed died.
- A young dying patient named Peggy saw her aunt, who lived in another state, appear right next to her. It was later found that the aunt had died at the same time.
- Having a feverish close encounter with death, a young boy named Eddie Cuomo reported seeing dead relatives in heaven, and being told by his sister Teresa that he must go back. Very shortly thereafter, his parents checked on the status of Teresa, and found out she had died while attending college.
- A woman had a near-death experience in which she reported seeing a vision of her brother, a brother she had never known of. Her father then confessed that she did have a brother, whose existence she had never learned of.

Greyson's paper gives references for all of these cases, allowing you to

find them in their original source descriptions.

These cases provide some of the strongest evidence of life after death. We cannot explain any of these cases as some hallucination based on expectation, because in each of these cases we have some kind of vision that matches reality, but does not match the expectation of the person having the vision. Because these "Peak in Darien" cases provide a distinctive type of evidence for life after death (something we can't expect to have happen in a purposeless universe), these cases provide yet another hint of cosmic purpose.

Afterword

So I have now presented 50 hints of cosmic purpose. An objective reader should regard this as an overwhelming case for cosmic purpose. But there will no doubt be skeptics and materialists who reject this case. What kind of objections will they make? It is easy to foresee these objections, and rebut them before they are made.

One type of strategy a skeptic may take is to attempt to dismiss all types of evidence involving human experiences outside of the laboratory. The skeptic will urge that we dismiss all such evidence on the grounds that it is "merely anecdotal." But such reasoning makes no sense. Evidence is anecdotal if it involves human testimony (an anecdote is simply a story told by some one). There is no reason at all why we should be excluding human testimony just because it is made outside of a laboratory.

Consider what goes on in a court. A person gives testimony on something he observed. Our society takes such testimony very seriously. A defendant can be sentenced to 50 years in prison based on the testimony of a single individual. Such evidence is "merely anecdotal," but society treats it as seriously as some scientific laboratory finding. So it makes no sense to dismiss some of the items on my list on the basis that they are "merely anecdotal." In each of the cases I have given involving human testimony, there is not just one person claiming to have witnessed something, but quite a few different people (usually many people). If society can send someone to prison for 50 years based on a single person's testimony, why shouldn't we take very seriously some kind of phenomena that has been witnessed by quite a few people, usually dozens or hundreds or thousands of people?

I may note that quite a few items I have discussed relating to paranormal or psychic phenomena are items that are strongly supported by evidence gathered in laboratories under controlled scientific conditions. These items include the evidence for ESP, precognition, remote viewing, past life

regressions, mental mediumship, out-of-body experiences, and physical mediumship. If we add the items of evidence gathered under well-documented clinical conditions with multiple professional witnesses (conditions very close to laboratory conditions), then we must also include several other items on my list (such as the items involving near-death experiences).

What about all of the items I have discussed suggesting that our universe needed a series of fantastically improbable lucky breaks in order for intelligent life to appear? A skeptic might attempt to brush off such evidence by saying, "We just got lucky." But that is not a successful rebuttal – it's just an assertion, and a very unbelievable assertion at that.

It is a basic law of probability that to calculate the chance of several unrelated things happening (each of which has no causal connection to the others), we simply multiply together the individual probabilities of the things. So if your chance of winning a particular lottery is 1 in a million on any particular day, your chance of winning that lottery with two tickets bought on separate days is 1 in a million times 1 in a million, which equals 1 in a trillion (1 in 1,000,000,000,000).

The items on my "50 Hints of Cosmic Purpose" list involving lucky coincidences needed for the existence of intelligent life are unrelated requirements that have no natural causal connection with each other. The chance of a random universe having a proton charge exactly matching its electron charge to thirty decimal places (Chapter 1) is not naturally related to the chance of a universe having a vacuum energy density of almost zero through a coincidental cancellation of energies (Chapter 5). Neither of these items is naturally related to the similarly improbable coincidence needed for a low-energy Higgs (chapter 43). To compute the probability of all of these things accidentally happening in the same universe, we must multiply together the individual probability of each of them occurring by chance.

When you add up all of the "coincidences" and "lucky accidents" needed for a random universe to be compatible with intelligent life (the items documented in this book), you have a streak of luck with a probability of roughly one chance in a thousand million billion trillion quadrillion quintillion sextillion septillion (1 chance in 1,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000). That is 1 chance in 10 to the 108^{th} power, or roughly one chance in a googol. A googol is 10 followed by 99 zeroes.

Can we reasonably believe that this was merely due to a lucky series of

coincidences? We cannot. The probability of such a series of coincidences happening by pure blind luck is equal to the probability of you meeting 10 strangers at a party, and correctly guessing all of their social security numbers.

Backed into the corner by such reasoning, there is a last-ditch mind trick that will evoked by a believer in the Blind Chance dogma (the doctrine that our universe is the purposeless product of purely accidental factors). Such a person will evoke the idea of a multiverse, a vast ensemble of universes. There isn't the slightest evidence that any such thing exists, but a materialist may nonetheless try to use such a possibility to his advantage. He will argue: *perhaps there are an infinite or nearly infinite number of universes, and if so, we would expect that at least one of them would have the right characteristics for intelligent life, purely by chance – so maybe our universe is such a universe.*

But the defects of this approach are many: the nearly infinite baggage of assuming all of those universes, almost all uninhabited; the violation of the long-cherished principle of Occam's Razor asserting that "entities should not be multiplied beyond necessity" when trying to explain something; the extreme violation of the principle of mediocrity asserting that a random sample from a larger population should be assumed to be representative of the population; the fact that we have never had a verified case of anything being successfully explained by a multiverse; the fact that while the probability of *some* universe being habitable by chance may be improved by assuming other universes, the probability of any particular universe (including *our* universe) being habitable by chance is not at all improved by such an assumption, not even by even 1 percent.

The last of these objections is perhaps the best one, so let us consider it very closely. I just discussed there is no greater than 1 chance in a googol (10 followed by 99 zeroes) of a random universe having the characteristics needed for intelligent life. Now suppose one imagines that there are a googol times a googol universes (a number of universes equal to 1 followed by 199 zeroes). Such an assumption increases the chance that *some* universe might be coincidentally and accidentally compatible with the existence of intelligent life. But it does absolutely nothing whatsoever to increase the chance that *any particular one* of those universes would be coincidentally and accidentally compatible with the existence of intelligent life.

So basically the multiverse assumption accomplishes nothing. The believer in the Blind Chance dogma has to believe that our universe is a "googol to one" shot (something with a likelihood of 1 in 10 to the hundredth power) *before* making the multiverse assumption, and he is

stuck with exactly the same probability even *after* he introduces the idea of a multiverse. Such a reasoner has committed the ultimate philosophical folly – he's introduced a vast collection of universes which accomplish absolutely nothing to back up his thesis that our universe is the result of blind chance Talk about worthless excess baggage.

When the concept is used to explain away the fine-tuning of our universe, there is no version of multiverse reasoning that can hold up to scrutiny. Multiverse arguments melt like ice cream in a hot summer sun, as soon as one applies a little logic to them. The very idea of using multiverse reasoning to explain away apparent cases of design or purpose is ludicrous. Imagine if you were walking with someone, and you passed a house that had what looked like a well-designed garden next to it. You can imagine what you would think if the person you were walking with were to reason as follows: *this garden isn't the result of intention and design and purpose – we can explain it by assuming that there are a billion trillion random universes, and that in at least one of these universes there would be a garden that accidentally and randomly looked as orderly as this garden*. You would surely doubt the reasonableness of such a person. Why bring in the nearly infinite "excess baggage" of a multiverse, when a nice, simple hypothesis of purpose or design can explain things?

Even if there were a purposeless multiverse, some vast collection of random "blind chance" universes, it would not explain dozens of the items on my list of "50 Hints of Cosmic Purpose." For example, in zero universes of a purposeless multiverse would we expect to see people who have dramatic near-death experiences in which they reported floating out of their bodies, often verifying medical details they could not have observed while unconscious. In zero universes of a purposeless multiverse would we expect to see people who have powers such as ESP, precognition, and remote viewing. In zero universes of a purposeless multiverse would we expect to find compelling evidence that some mediums can contact deceased people. In zero universes of a purposeless multiverse would we expect people to see crisis apparitions of people who recently died (and the "Peak in Darien" experiences discussed in Chapter 50). In zero universes of a purposeless multiverse would we even expect life and self-consciousness and all the human higher mental faculties to exist, because of reasons I have discussed why such things cannot be explained purely by evoking blind chance and Darwinian factors.

The numerical fine-tuning we see in our universe is a necessary condition for the existence and evolution of intelligent life, but such numerical fine-tuning is not a *sufficient condition* for the existence and evolution of intelligent life. In other words, merely getting a series of improbable numerical "lucky breaks" is not sufficient for a universe to allow

intelligent life to appear in a universe. This book shows that a universe must also have a series of astonishingly cooperative laws that favor the existence and evolution of intelligent life, and a kind of programming that drives that goal forward, a kind of information infrastructure supporting such a purpose (either that, or a long series of supernatural interventions). Not one single universe in a vast collection of random, accidental universes would have such things. Only a purposeful universe (a product or reflection of some higher cosmic intelligence) would have such things.

In short, the case for cosmic purpose is overwhelming.

Notes

Chapter 1:

The paper by Zorn, Chamberlain and Hayes is "Experimental Limits for the Electron-Proton Charge Difference and for the Charge of the Neutron," published in Physical Review, vol. 129, Issue 6, pp. 2566-2576 (publication date 03/1963).

http://adsabs.harvard.edu/abs/1963PhRv..129.2566Z

"The result, according to astronomer George Greenstein...": George Greenstein, *The Symbiotic Universe.* http://homepages.spa.umn.edu/~larry/CLASS/GLASSDARKLY/anthrop/anthr10.html

The paper by Sengupta and Pal is "Constraints on Cosmic Charge Asymmetry and Neutrino Charge from the Cosmic Microwave Background."

http://cds.cern.ch/record/274896/files/9501271.pdf

Chapter 2:

The text of *Phantasms of the Living* by Gurney, Myers, and Podmore can be accessed free of charge online by using the URL below:

https://archive.org/details/phantasmsoflivin02gurniala

"Survey of Claimed Encounters With the Dead" by Erlendur Haraldsson can be accessed using this URL:

http://www.spiritarchive.org/uploads/1/2/4/7/12470836/erlendur_haraldsson_-_survey_of_claimed_encounters_with_the_dead-1988-12pp.pdf

The CNN story "Do loved ones bid farewell from beyond the grave?" can be accessed using this URL:

http://www.cnn.com/2011/09/23/living/crisis-apparitions/index.html?hpt=hp_c1

The stories from *The Gift: ESP, the Extraordinary Experiences of*

Ordinary People by Sally Rhine Feather and Michael Schmicker is on pages pages 261-262, and page 221.

The L.A. Goodeve story or "Snettisham ghost" story is recounted on page 72 of *Psychics, Sensitives, and Somnambules* by Rodger I. Anderson (2006). See also *Paranormal Norfolk* by Frank Meeres, 2009, chapter 9.

Chapter 3:

The Science Daily quote can be found at this URL:
http://www.sciencedaily.com/releases/2014/08/140807145618.htm

Chapter 4:

For more information, see this URL:

http://www.victorzammit.com/evidence/endoflife.htm

"The biggest study of deathbed visions...": *At the Hour of Death* by Karlis Osis and Erlendur Haraldsson, Hastings House, 1977. page 51-60.

"Great beauty and peace dominated...": the same book, page 177.

"The account below is a typical one...": the same book, page 66.

Chapter 5:

"According to a UCLA astronomer...":
http://www.astro.ucla.edu/~wright/cosmo_constant.html

"One idea Professor Matt Strassler has discussed":

http://profmattstrassler.com/articles-and-posts/particle-physics-basics/quantum-fluctuations-and-their-energy/

Chapter 6:

The "Lethe Case" is discussed in *Mediumship and Survival: A century of investigations* by Alan Gauld, Chapter 7.

Details of the case are also discussed in this long blog post by Michael Prescott:

http://michaelprescott.typepad.com/michael_prescotts_blog/2013/08/lest-we-forget.html

Another discussion is found in this online document: “A Challenge to the Skeptic” by Archie. E. Roy.

http://books.google.com/books?id=Hhw3VhqBfgsC&pg=PT115&lpg=PT115&dq=Lethe+case&source=bl&ots=zz2t9L_AQ8&sig=s7xk5GxrBvQG_HxIHQWjLMZrEc8&hl=en&sa=X&ei=OwkBVKraL8LpggTMooHADg&ved=0CC8Q6AEwBQ#v=onepage&q=Lethe%20case&f=false

The case of Raymond Lodge (son of Oliver Lodge) is discussed in this URL:

http://www.fst.org/lodge.htm

For a discussion of the “Book and Newspaper” tests involving Charles Drayton Thomas, see this URL:

http://whitecrowbooks.com/books/feature/the_book_and_newspaper_tests

Schwartz's study (done with Julie Beischel, PhD) was entitled “Anomalous Information Reception By Research Mediums Demonstrated Using a Novel
Triple-Bind Protocol.” It can be read using this URL:

http://www.deanradin.com/evidence/Beischel2007.pdf

Chapter 7:

“The physicist Paul Davies has said...”: *The Accidental Universe* by Paul Davies, page 69-70.

The paper by Csoto, Oberhummer, and Schlattl can be found here:

http://arxiv.org/pdf/nucl-th/0010052.pdf

See this pdf file for more information:

http://www.focus.org.uk/strongforce_long.pdf

Chapter 8:

“A study was done on the physical conditions”:
http://www.horizonresearch.org/ndearticle_1_.pdf

“A scientific paper by 8 neurologists...”: The paper was "Characteristics of Near-Death Experiences Memories as Compared to Real and Imagined Events Memories"
by Marie Thonnard and others, published in PLOS One, March 27, 2013. The URL is below:

http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0057620

Chapter 9:

“For example, in 1916 during World War I”: this account is from page 8 (case #2) of the following paper:

http://www.scientificexploration.org/journal/jse_12_3_cook.pdf

“In another case a salesman named W.A. Laufmann”: this account is from page 9 (case #3) of the above paper.

“In another case a Mrs. R. M.”: this account is from page 10 (case #5) of the above paper.

“In another case Al Sullivan”: this account is from page 14 (case #23) of the above paper.

The near-death experience involving a red shoe is reported in “Further Evidence for Veridical Perception During Near-Death Experiences” by Kenneth Ring, PhD and Madelaine Lawrence,
R.N., Ph.D. The URL is below:

http://newdualism.org/nde-papers/Ring/Ring-Journal%20of%20Near-Death%20Studies_1993-11-223-229.pdf

Both the tennis shoe incident and the red shoe incident are reported in *Lessons From the Light: What We Can Learn From the Near-death Experience* by Kenneth Ring, PhD, Moment Point Press, 1998, pages 65-68.

The near-death experience involving dentures is discussed in the paper “Corroboration of the Dentures Anecdote Involving Veridical Perception in a Near-Death Experience” by Rudolf H. Smit. The URL is below:

http://www.merkawah.nl/public_html/images/stories/jndsdentureman.pdf

The Pam Reynolds near-death experience was originally reported in the book *Light and Death* by Dr. Michael Sabom. For a NPR discussion of

this incident, see the URL below:

http://www.npr.org/templates/story/story.php?storyId=104397005

For more examples, see this file:

http://www.scientificexploration.org/journal/jse_12_3_cook.pdf

Chapter 11:

The Wilkins and Sherman experiment is described in their book *Thoughts Through Space*.

The wikipedia.org quote is from this URL:

http://en.wikipedia.org/wiki/Ganzfeld_experiment

The Dean Radin quotes are from pages 195 and 197 of his book *Supernormal: Science, Yoga, and the Evidence for Extraordinary Psychic Abilities*.

The Sheldrake paper is "Telepathy in Connection with Telephone Calls, Text Messages, and Emails," published in the Journal of International Society of Life Information Sciences (ISLIS), Vol. 32, #1, March 2014. A URL for it is below: http://www.sheldrake.org/files/pdfs/papers/ISLIS_Vol32.pdf

The case of Nandana Unnikrishnan is discussed at the URL below:

http://www.khaleejtimes.com/kt-article-display-1.asp?xfile=data/infocus/2013/March/infocus_March14.xml&section=infocus

The paper by Dr. Diane Hennacy Powell is "Evidence for Telepathic Communication in a Nonverbal Autistic Child." It can be found at the URL below (scroll down to page 25):

http://www.parapsych.org/articles/46/213/2014_pa_convention_abstracts_of.aspx

Chapter 13:

The URLs for the references to ribose sugars are below:

http://thurj.org/feature/2013/01/3941/
http://en.wikipedia.org/wiki/Abiogenesis

The URL for the reference to purines is below:

http://www.arn.org/docs/odesign/od171/rnaworld171.htm

The URL for the reference to nucleotides is below:

http://en.wikipedia.org/wiki/RNA_world_hypothesis

The paper by Orgel is "Prebiotic Chemistry and the Origin of the RNA World." The URL is below:

http://www.d.umn.edu/~pschoff/documents/OrgelRNAWorld.pdf

The Freeman Dyson quote is from his book *Origins of Life*, page 25.

Chapter 14:

The Trevors and Abel paper is "Chance and Necessity Do Not Explain the Origin of Life" published in Cell Biology International 28 (2004) 729-739

http://www.ncbi.nlm.nih.gov/pubmed/15563395

Chapter 15:

"In 1977 the CIA director...":

http://www.scientificexploration.org/journal/jse_10_1_targ.pdf

Chapter 16:

"According to an article on www.smithsonian.com": the URL for the article is below:

http://www.smithsonianmag.com/arts-culture/patience-worth-author-from-the-great-beyond-54333749/?no-ist=&c=y&page=1

"According to the Guardian's obituary":

http://www.theguardian.com/news/2002/jul/11/guardianobituaries.booksobituaries1

Chapter 18:

The Jagdis Chandra case is discussed on page 27 of *Psychics, Sensitives, and Somnambules* by Rodger L. Anderson. The Shanti Devi case is discussed on page 41 of that book.

The Stevenson paper is "Birthmarks and Birth Defects Corresponding to Wounds on Deceased Persons" published in *Journal of Scientific Exploratio*n, Vol.7, No.4,pp.403-410,1993.

http://www.medicine.virginia.edu/clinical/departments/psychiatry/sections/cspp/dops/dr.-stevensons-publications/STE39stevenson-1.pdf

See also this URL:
http://www.near-death.com/experiences/reincarnation01.html

For more on the research of Jim Tucker, see the URL below:

http://www.skeptiko.com/239-dr-jim-tucker-database-of-past-life-memories/

Chapter 20:

"Home was investigated at length by the eminent scientist Sir William Crookes..." See the URL below for Crookes' lengthy first hand account.

http://www.mindserpent.com/American_History/books/Crookes/researches/investigation.htm

The paper "Stella C - A Record of Thirteen Sittings for Thermo-Psychic and Other Experiments"
by Harry Price is in The Journal of the American Society for Psychical Research (Vol. XVIII, No. 5, May 1924). The paper can be read using this URL:

http://www.harrypricewebsite.co.uk/Writings/ASPRJournals/asprjournal-may1924-02.htm

Chapter 22:

The Scientific American quote can be found here:

http://www.scientificamerican.com/article/electron-perfectly-round-to-one-part-in-million-billion-experiment-finds/

The Guardian story can be found here:
http://www.theguardian.com/science/2011/may/25/electrons-round-cosmos

The New Scientist story can be found here:

http://www.newscientist.com/article/dn14229-roundest-objects-in-the-world-created.html#.UfaWsayZaCg

Chapter 23:

See these URLs for more information on the topics discussed in this chapter:

http://www.pureinsight.org/node/1165
http://www.victorzammit.com/evidence/pastliferegressions.htm

Chapter 24:

"One cosmologist has noted": see the URL below:

http://www.dailygalaxy.com/my_weblog/2013/11/our-understanding-of-gravity-is-fundamentally-wrong-two-conflicting-theories-of-the-universe.html

Chapter 25:

"Red dwarf stars are not believed to be as favorable for life's evolution:"

http://phys.org/news/2014-06-red-dwarf-planets-hostile-space.html#inlRlv

Chapter 26:

"A writer on the www.theatlantic.com web site...": the URL for the article is below:

http://www.theatlantic.com/health/archive/2014/09/why-do-people-believe-in-ghosts/379072/

Chapter 27:

The Guggenheim's web site is below:

http://www.after-death.com/Pages/About/ADCProject.aspx

The 2006 blog post with many, many user comments can be read here:

http://kimmercials.com/2006/10/finding-dimes.html

Chapter 29:

The polls about ESP and paranormal beliefs can be found at these URLs:

http://www.gallup.com/poll/16915/three-four-americans-believe-paranormal.aspx
http://www.theage.com.au/national/faith-what-australians-believe-in-20091218-l5qy.html

http://articles.chicagotribune.com/1991-06-16/features/9102230509_1_paranormal-gallup-poll-extra-sensory-perception

“In a poll of 1006 adults...“: the poll can be found at this URL:

http://news.bbc.co.uk/2/hi/uk_news/5017910.stm

The stories of Martha Burke and Nita Hurst can be found here:

http://www.noetic.org/noetic/issue-twenty-one-april/twin-telepathy-and-the-illusion-of-separation/

“On a Thanksgiving day a daughter...” *The Gift: ESP, the Extraordinary Experiences of Ordinary People* by Dr. Sally Rhine Feather and Michael Schmicker, St. Martin's Press, 2005, page 29.

“During another family meeting...”: the same book, page 28.

“While at work a twin...”: the same book, page 40.

“A mother had a severe pain in her right hand...”: the same book, page 78.

“A daughter felt horrible pain in her arm...”: the same book, page 112.

“A man cried out that his Uncle Joe...:” the same book, page 39.

Chapter 30:

The story of Anna Katharina Ehmer was published in "The Death of Anna Katharina Ehmer: A Case Study of Terminal Lucidity" in the journal OMEGA, Vol. 68(1) 77-87, 2013-2014.

The story can be read here:

http://www.medicine.virginia.edu/clinical/departments/psychiatry/sections/cspp/dops/greyson-publications/NDE72terminal%20lucidity-Omega.pdf

"In another scientific paper...":

http://www.ncbi.nlm.nih.gov/pubmed/20010032

"83 cases published by 55 different authors. In one study by Brayne,..": the paper is "Terminal lucidity: A review and a case collection" by Nahm, Greyson, Kelly, and Haraldsson. It can be read at the URL below:

http://deanradin.com/evidence/Nahm2011.pdf

See the same paper for other stories mentioned in this chapter.

Chapter 31:

"The physicist Paul Davies puts it this way...": *The Accidental Universe* by Paul Davies, page 91.

"What would be the ratio between the unsuitable bubble universes and the suitable bubble universes?": See page 42 of the scientific paper below for support for this statement.

http://arxiv.org/pdf/1104.2324v2.pdf

Chapter 33:

The Blaisdel family ghost story is told on page 18 of *Psychics, Sensitives, and Somnambules* by Rodger I. Anderson.
The Morton ghost or Cheltenham ghost story is told on page 41 of the same book.
Detailed information can be found online using this URL:

http://www.scribd.com/doc/74564694/Case-Study-Review-Morton-Ghost

The story involving Rosa B. Sutton is told on page 169 of Anderson's book. The Samuel Bull case is told on page 23 of the same book.

"Bill and Judy Guggenheim have described...": Guggenheim and Guggenheim, *Hello from Heaven!* (ADC Project, 1995), pages 290-300.

Details on the story of the ghosts of Flight 401 can be found in the book *The Ghost of Flight 401* by John B. Fuller.

Chapter 35:

The Karl Scala incident is reported in *Parting Visions* by Melvin Morse, page 45-46. See the URL below:

http://www.near-death.com/experiences/evidence09.html

The Tart experiment is described at this URL:

http://www.near-death.com/tart.html

Chapter 37:

Csoto, Oberhummer, and Schlatt's paper can be read here:

http://arxiv.org/pdf/nucl-th/0010052.pdf

The paper by Jeltema and Sher can be read here:

http://arxiv.org/pdf/hep-ph/9905494.pdf

The Hoyle quote can be found here:

http://cosmosmagazine.com/features/life-universe-and-everything/

Chapter 38:

The paper by Sean Carroll is *In What Sense Is the Early Universe Fine-Tuned?* , and can be read at this URL:

http://arxiv.org/abs/1406.3057

Chapter 39:

The story of John Williams and the assassination of Perceval is found at this URL:

http://www.lookandlearn.com/blog/17297/the-man-who-foretold-the-assassination-of-spencer-perceval/

"One person who had a ticket...": Larry Dossey, MD, *The Science of Premonitions*, page 108.

"In 1950 a church blew up in Beatrice...": the same book, page 42.

The falling chandelier story is reported on page 2 of *The Gift: ESP, the Extraordinary Experiences of Ordinary People* by Sally Rhine Feather and Michael Schmicker.

"Dr. Larry Dossey reported that a woman...": Larry Dossey, MD, *The Science of Premonitions*, page 9.

The Aberfan avalanche premonition is discussed on pages 23-24 of the same book. The Winston Churchill premonitions are discussed on page 144 of the same book.

The Boisseau dream is discussed below:

http://www.legacy.com/sept11/story.aspx?personid=132609

"The book states...": *The Gift: ESP, the Extraordinary Experiences of Ordinary People* by Sally Rhine Feather and Michael Schmicker, page 69. .

Chapter 40:

The story of Andrew Jackson Davis can be found here:

http://www.andrewjacksondavis.com/index.htm

"The strange case of George William Chapman...": page 28 of *Psychics, Sensitives, and Somnambules* by Rodger I. Anderson.

Arigo case: the same book, page 8. A youtube.com video on Arigo can be found here:

https://www.youtube.com/watch?v=4BX6WTL88j4

"In 1993 O'Regan and Hirshberg...": the quote is from page 61 of *Supernormal* by Dean Radin, PhD.

Chapter 41:

Longo's study can be found here:

http://arxiv.org/ftp/arxiv/papers/1104/1104.2815.pdf

Shamir's study can be found here:

http://arxiv.org/pdf/1207.5464v1.pdf

The paper by Ibata and Lewis can be found here:

http://www.nature.com/nature/journal/v511/n7511/full/nature13481.html

Chapter 43:

"Physicist Matt Strassler once specified...": the blog post can be found here:

profmattstrassler.com/articles-and-posts/particle-physics-basics/the-known-apparently-elementary-particles/the-known-particles-if-the-higgs-field-were-zero/

"Here is how one particle physicist states...": see the URL below:

http://www.pbs.org/wgbh/nova/blogs/physics/2013/02/why-is-the-higgs-so-light/

Chapter 45:

Bem's "Feeling the Future" study (*Feeling the Future: Experimental Evidence for Anomalous Retroactive Influences on Cognition and Affect*) can be found here:

http://caps.ucsf.edu/wordpress/wp-content/uploads/2011/02/bem2011.pdf

"Bem and others published a meta-analysis...": the study was "Feeling the Future: A Meta-Analysis of 90 Experiments on the Anomalous Anticipation of Random Future Events," and can be read here:

http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2423692

"A 1989 meta-analysis...": the study was "Fortune Telling: A Meta-analysis of Forced-choice Precognition Experiments 1935-1987," and can be found here:

http://www.deanradin.com/evidence/Honorton1989precogMA.pdf

For free-response experiments, see this URL:

http://www.deanradin.com/evidence/Radin2011AAAS.pdf

"Gary Schwartz PhD did a remarkable precognition experiment..." : See the URL below for a scientific paper describing the experiment:

http://www.drgaryschwartz.com/files/QuickSiteImages/GES_JSPS_12_23_10_with_journal_cover_pdf_backup.pdf

"According to Dean Radin, PhD...": The quote is from page 235 of his book *Supernormal.*

"He summarizes the results as follows...": The quote is from page 265 to 266 of Dean Radin's book *Supernormal.*

Chapter 46:

"The exact figure given in a scientific paper...": The paper is "Experimental Limits for the Electron-Proton Charge Difference and for the Charge of the Neutron," by Jens. C. Zorn and others., Physical Review, vol. 129, Issue 6, pp. 2566-2576, 03/1963. The URL is below:

http://adsabs.harvard.edu/abs/1963PhRv..129.2566Z

Chapter 47:

An abstract off Schwartz's paper can be found here (scroll down to page 15 and 16):

http://www.parapsych.org/articles/37/213/2014_pa_convention_abstracts_of.aspx

See this URL for information on the Scole experiments:

http://www.thescoleexperiment.com/artcl_04.htm

Chapter 48:

"According to an article on the Science Daily web site...": the URL is below:

http://www.sciencedaily.com/releases/2010/05/100510151356.htm

" Summarizing research done by Elisabeth Rieper...": the URL is below:

http://www.technologyreview.com/view/419590/quantum-entanglement-holds-dna-together-say-physicists/

Chapter 49:

“One recent study involving quasars...”: the URL is below:

http://www.eso.org/public/news/eso0407/

Chapter 50:

Greyson's paper on “Peak in Darien” experiences can be found here:

http://www.deanradin.com/evidence/Greyson2010.pdf

Bibliography

The Accidental Universe by Paul Davies, Cambridge University Press, 1982.

Psychics, Sensitives, and Somnambules by Rodger I. Anderson, Macfarland and Company, 2006. An extremely scholarly book with as fascinating a collection of stories as you could hope to find. Discusses almost every important psychic and medium, along with most important parapsychology researchers.

The Gift: ESP, the Extraordinary Experiences of Ordinary People by Dr. Sally Rhine Feather and Michael Schmicker, St. Martin's Press, 2005. A fascinating collection of hundreds of reported cases of ESP.

The Science of Premonitions by Larry Dossey, M.D., the Penguin Group (Plume), 2009. One of the most complete and interesting books on precognition and premonitions available anywhere.

Extraordinary Knowing: Science, Skepticism, and the Inexplicable Powers of the Human Mind by Elizabeth Lloyd Mayer, PhD, Bantam Books 2007. An excellent overview of research on paranormal phenomena, with some fascinating personal anecdotes.

Supernormal: Science, Yoga, and the Evidence for Extraordinary Psychic Abilities by Dean Radin, PhD, Crown Publishing, 2013. This scholarly work with very many footnotes provides a huge amount of evidence for various forms of psychic phenomena.

Cosmic Jackpot: Why Our Universe is Just Right for Life by Paul Davies, Houghton Mifflin Company, 2007. A physicist's discussion of cosmic fine-tuning, with a wide discussion of philosophical implications and alternatives.

Return to Life: Extraordinary Cases of Children Who Remember Past Lives by Jim B. Tucker, M.D., St. Martin's Press, 2013

Lessons From the Light: What We Can Learn From the Near-death Experience by Kenneth Ring, PhD, Moment Point Press, 1998

At the Hour of Death by Karlis Osis and Erlendur Haraldsson, Hastings House, 1977.

The Fine-Tuning of the Universe for Intelligent Life by Luke A. Barnes.

http://arxiv.org/abs/1112.4647